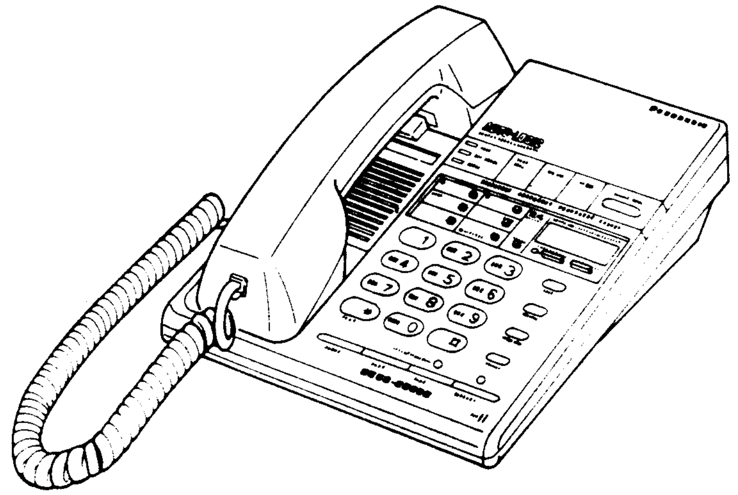
ORDER NO. KM48907954C1
F1

Service Manual
and Technical Guide

AUTO-LOGIC™
EASA-PHONE®
iTS Integrated
Telephone System

Telephone Equipment
KX-T2634
(Silver)
(White)



SPECIFICATIONS

General:

Power Source:	AC; AC adaptor KX-A11 (DC 12 V)
Power Output:	350 mW (max.)
Speaker:	Unit; 6.5 cm (2$^1/_2$") PM dynamic Handset; 2.6 cm (1$^3/_{16}$") PM magnetic type
Microphone:	Condenser microphone
Jacks:	Telephone line, DC IN
Dimensions:	164 (W)×216 (D)×97 (H) mm (with handset) (6$^{15}/_{32}$" × 8$^1/_2$" × 3$^{13}/_{16}$")
Weight:	0.97 kg (2 lbs 2.22 oz)

Telephone Section:

Memory Capacity:	26 telephone numbers, up to 16 digits for each station
Dial Speed:	Tone (DTMF)/Pulse (10 pps)
Redial:	Last dialed telephone number up to 15 times in 10 minute period
Pause:	Two automatic dial tone detectors

Tape Deck Section:

Outgoing Message (OGM):	Recorded on a microchip. Recording Time is 16 seconds.
Incoming Message (ICM):	Micro Cassette (MC-30) (1 MIN/VOX/AO)
Tape Speed:	2.4 cm/s
Wow and Flutter:	0.58% (WRMS)
Motor:	Electrical governor motor

Design and specifications are subject to change without notice.

Panasonic

Matsushita Services Company
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Corporation of America
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of Puerto Rico, Inc.
San Gabriel Industrial Park
65th Infantry Ave. Km.9.5
Carolina, Puerto Rico 00630

When you mention the serial number, write down the 11 digits. The serial number may be found on the label affixed to the bottom of the unit.

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LOCATION OF CONTROLS

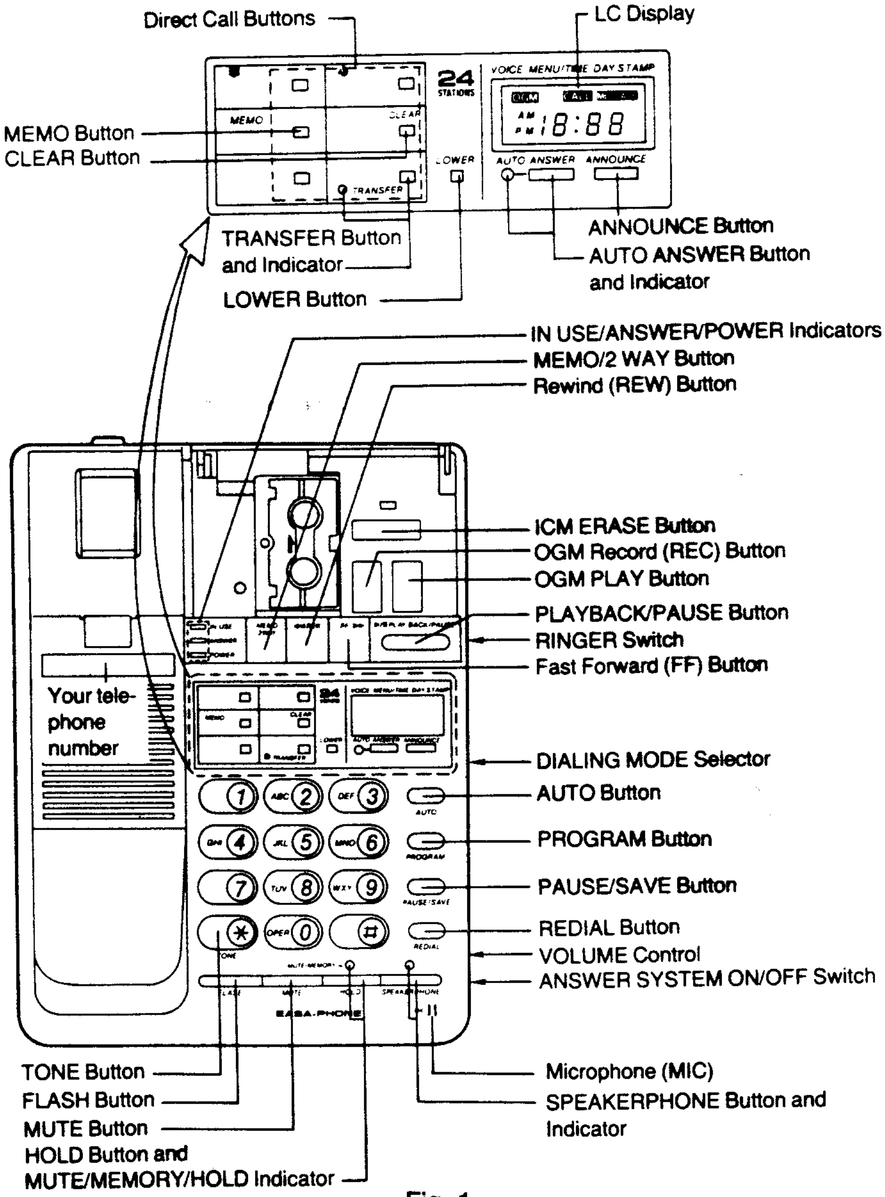

Direct Call Buttons
LC Display
MEMO Button
CLEAR Button
TRANSFER Button and Indicator
LOWER Button
ANNOUNCE Button
AUTO ANSWER Button and Indicator
IN USE/ANSWER/POWER Indicators
MEMO/2 WAY Button
Rewind (REW) Button
ICM ERASE Button
OGM Record (REC) Button
OGM PLAY Button
PLAYBACK/PAUSE Button
RINGER Switch
Fast Forward (FF) Button
Your telephone number
DIALING MODE Selector
AUTO Button
PROGRAM Button
PAUSE/SAVE Button
REDIAL Button
VOLUME Control
ANSWER SYSTEM ON/OFF Switch
TONE Button
FLASH Button
MUTE Button
HOLD Button and MUTE/MEMORY/HOLD Indicator
Microphone (MIC)
SPEAKERPHONE Button and Indicator
24 STATIONS
VOICE MENU/TIME DAY STAMP
MEMO
CLEAR
TRANSFER
LOWER
AUTO ANSWER
ANNOUNCE
EASA-PHONE

Fig. 1

DISASSEMBLY INSTRUCTIONS

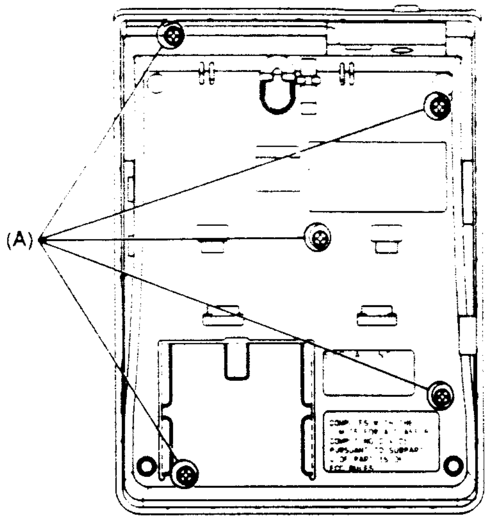


Fig. 2

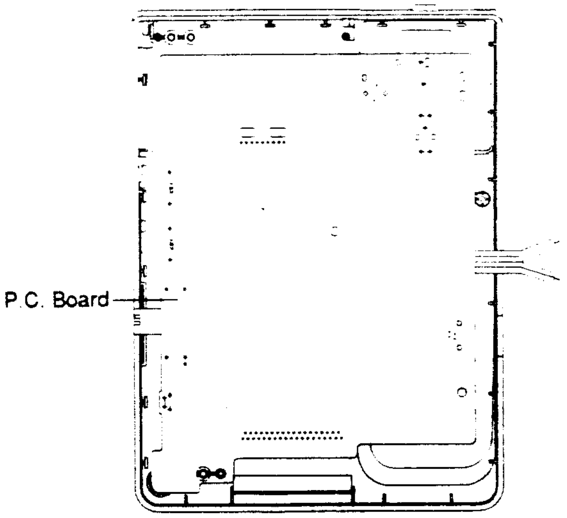


Fig. 3

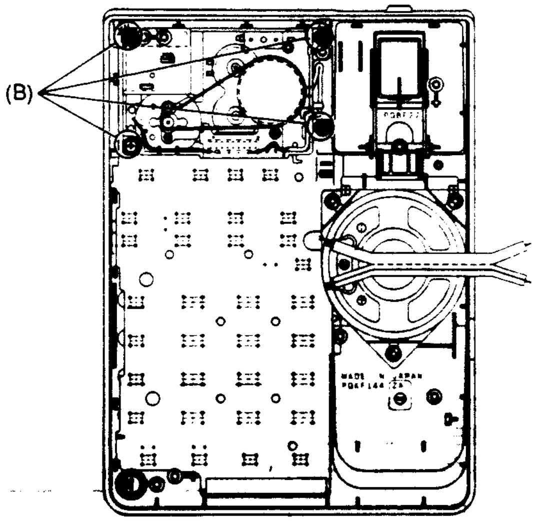


Fig. 4

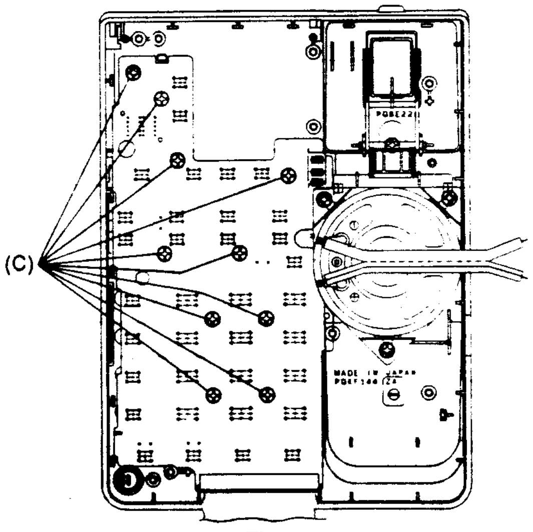


Fig. 5

(JX2PV407Z TYPE ONLY)

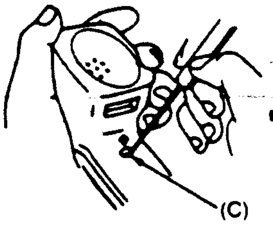


Fig. 6

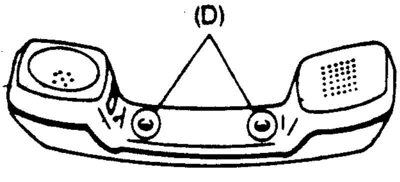
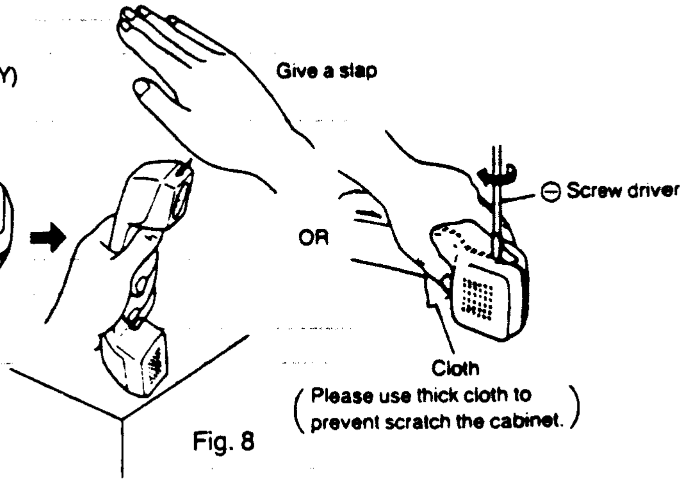


Fig. 7



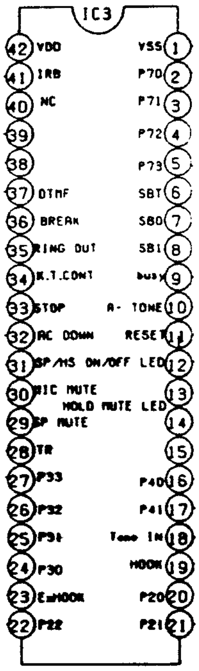
(Please use thick cloth to prevent scratch the cabinet.)

Fig. 8

Note: JX2PV408Z can't be disassembled.

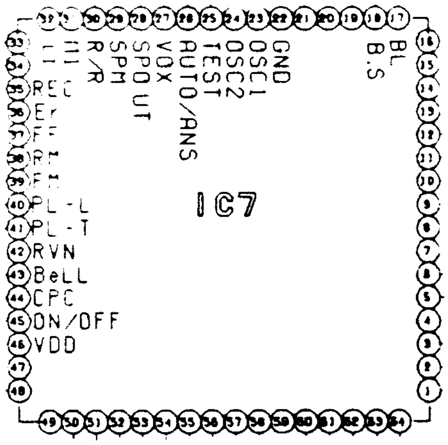
Ref. No.	Procedure	Shown in Fig.—	To remove—	Remove—
1	1	2	Lower Cabinet	Screws (3×16) .... (A)×5
2	1, 2	3	Main Printed Circuit Board	Remove the Main Printed Circuit Board
3	1~3	4	Cassette Deck	Screws (3 × 10) .... (B) × 4
4	1~4	5	Sub Printed Circuit Board	Screws (3 × 6) .... (C) × 10
5	5~7	6	Handset Cabinet	Rubbers .... (D)×2
6		7		Screws (3×10) .... (E)×2
7		8		Remove the cabinet

CPU DATA


IC3
42 VDO
41 IRB
40 NC
39
38
37 DTMF
36 BREAK
35 RING OUT
34 K.T.CONT
33 STOP
32 AC DOWN
31 SP/HS ON/OFF LED
30 MIC MUTE
29 SP MUTE
28 TR
27 P33
26 P32
25 P31
24 P30
23 ExHOOK
22 P22
VSS 1
P70 2
P71 3
P72 4
P73 5
SBT 6
SB0 7
SB1 8
busy 9
A- TONE 10
RESET 11
12
HOLD MUTE LED 13
14
15
P40 16
P41 17
Tone IN 18
HOOK 19
P20 20
P21 21

Part No.	MN158413KPC
Program ROM	4K
Internal RAM	3K bit
Clock Frequency	3.58 MHz
Power Supply Voltage	2.5~5.5 V

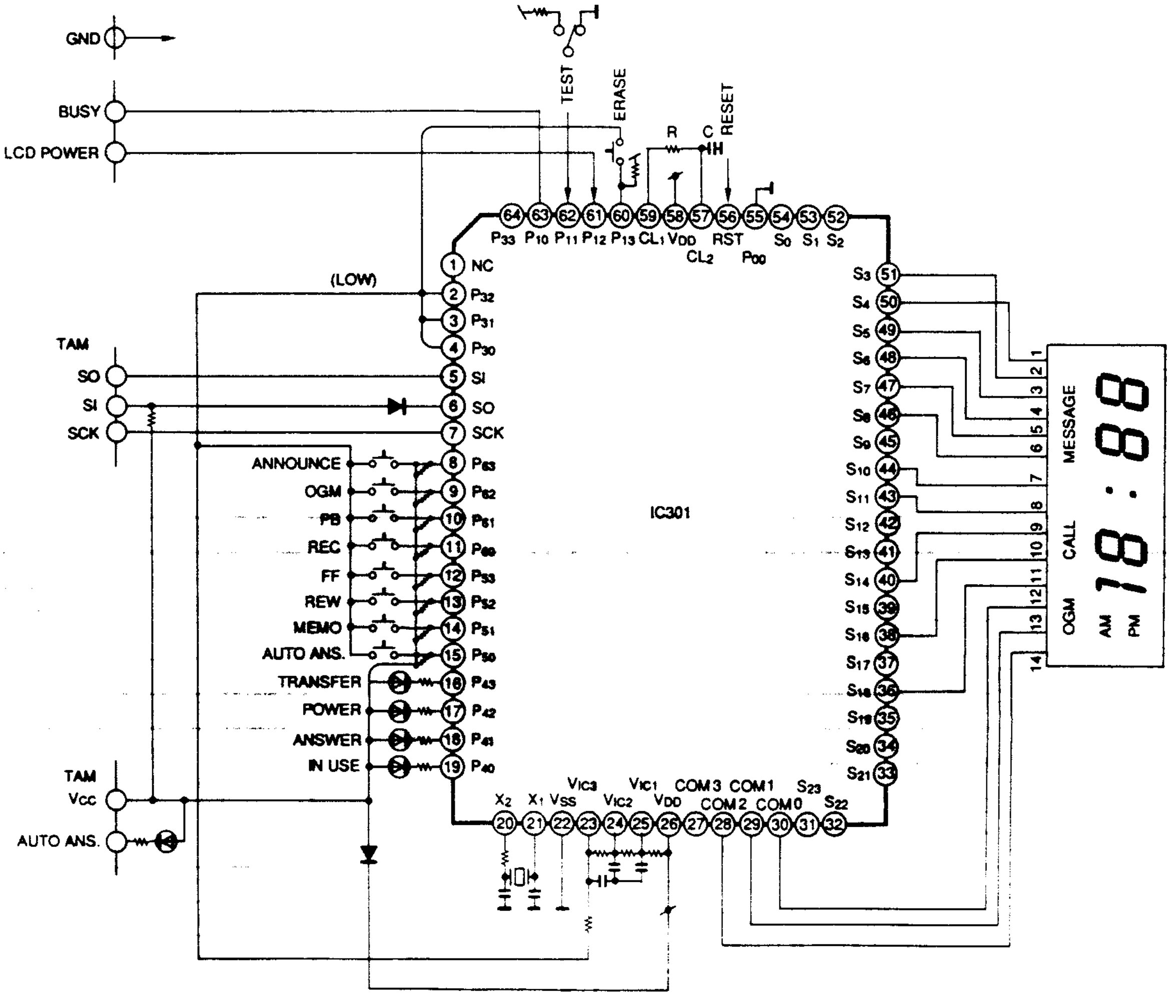
No.	Function	High	Low
1	0 V		
2	Key scan signal output	Normal(H-imp)	Active
3	Key scan signal output		
4	Key scan signal output		
5	Key scan signal output		
6	Serial clock output	Normal	Active
7	Serial data output to TAM's CPU	Active	Active
8	Serial data input from TAM's CPU		
9	Serial busy signal output	Normal	
10	Audible Tone & Privacy Ring output		Normal
11	Reset Signal Input		Active
12	Mute/Memory LED control signal out	OFF	ON
13	------------		
14	------------		
15	ON/OFF LED control signal output	OFF	ON
16	Option switch signal input	Normal	Active
17	Option switch signal input	Normal	Active
18	Tone signal input	Disable	Enable
19	Hook switch signal input	ON-Hook	OFF-Hook
20	Key scan signal output	Normal	Active
21	Key scan signal output	Normal	Active
22	Key scan signal output	Normal	Active
23	Ex-Hook detect signal input	OFF-Hook	ON-Hook
24	Key scan signal input	Normal	Active
25	Key scan signal input		
26	Key scan signal input		
27	Key scan signal input		
28	TR control signal output	ON	OFF
29	SP-MUTE signal output		
30	MIC-MUTE signal output		
31	SP-Phone/Handset control output	Speakerphone	Handset
32	Power-Down signal input	AC Power	AC-Down
33	Stop signal input	Active	Stop
34	Audible tone output control to TAM's CPU	Normal (H-imp)	Active
35	Privacy Ring control signal output	Active (H-imp)	Normal
36	Dial-pulse signal output	Make	Break
37	DTMF signal output		Normal
38	System clock		
39	System clock		
40	------------------		
41	------------------		
42	⊕ power supply		



Part No.	PQVI4678A02H
Power Supply	4.5~5.4 V
Program ROM	8K
Inside Data RAM	512 bit

No.	Function	High	Low	No.	Function	High	Low
1	C0			33	L-OUT	ON	Normal
2	C1			34	VG MUTE		OFF
3	C2			35	REC		
4	C3			36	ERASE		
5	SCK to LCD	Normal	Active	37	FF PLAY	F F	PLAY
6	SI from LCD	Normal		38	R MOTOR	ON	OFF
7	SO to LCD	Active		39	F MOTOR		
8	BUSY to LCD	Normal		40	PL-L		
9	SCK from ITS	Normal		41	PL-T		
10	SI from ITS	Active		42	RVN Input		
11	SO to ITS	Active		43	BELL Input	Normal	Bell
12	Busy from ITS	Normal		44	CPC Input	Normal	CPC
13	LCD Power	ON	OFF	45	ON/OFF SW	ON	OFF
14	Key tone control	Normal	Active	46	Vcc		
15	AC Down	AC Power	AC-Down	47	ACL Output		Clear
16	OGM Play	Play	Normal	48	EOS Input	END	
17	BEEP-L			49	WR Output	REC	PLAY
18	BEEP-S			50	STOP Output	STOP	
19				51	START Output	START	
20				52	OSCG Output	OSCG OFF	OSCG ON
21	Reset	Reset		53	BUSY Input	Normal	Busy
22	GND			54	VG START Output	START	
23	OSC1			55	A Vcc		
24	OSC2			56	A IN		
25	Test	Vcc Fixed		57	A IN		
26	Auto Ans LED	OFF	ON	58	GC		
27	VOX input	Disable	Enable	59	Vref		
28	SP OUT	OUT	Normal	60	A GND		
29	SP MUTE	ON	OFF	61	C4		
30	PLAY REC	PLAY	REC	62	C5		
31	MIC	ON	OFF	63	STROB Output	Active	
32	L-IN	ON	Normal	64	VGRST Output	Normal	Reset

IC301 CONNECTIONS


GND
BUSY
LCD POWER
TAM
SO
SI
SCK
TAM
Vcc
AUTO ANS.
TEST
ERASE
R
C
RESET
(LOW)
IC301
1 NC
2 P32
3 P31
4 P30
5 SI
6 SO
7 SCK
8 P63
9 P62
10 P61
11 P60
12 P53
13 P52
14 P51
15 P50
16 P43
17 P42
18 P41
19 P40
20 X2
21 X1
22 VSS
23 VIC3
24 VIC2
25 VIC1
26 VDD
27 COM3
28 COM2
29 COM1
30 COM0
31 S23
32 S22
33 S21
34 S20
35 S19
36 S18
37 S17
38 S16
39 S15
40 S14
41 S13
42 S12
43 S11
44 S10
45 S9
46 S8
47 S7
48 S6
49 S5
50 S4
51 S3
52 S2
53 S1
54 S0
55 P00
56 RST
57 CL2
58 VDD
59 CL1
60 P13
61 P12
62 P11
63 P10
64 P33
ANNOUNCE
OGM
PB
REC
FF
REW
MEMO
AUTO ANS.
TRANSFER
POWER
ANSWER
IN USE
MESSAGE
CALL
OGM
AM
PM
18:88
1 2 3 4 5 6 7 8 9 10 11 12 13 14

ACCESSORIES AND PACKING MATERIALS

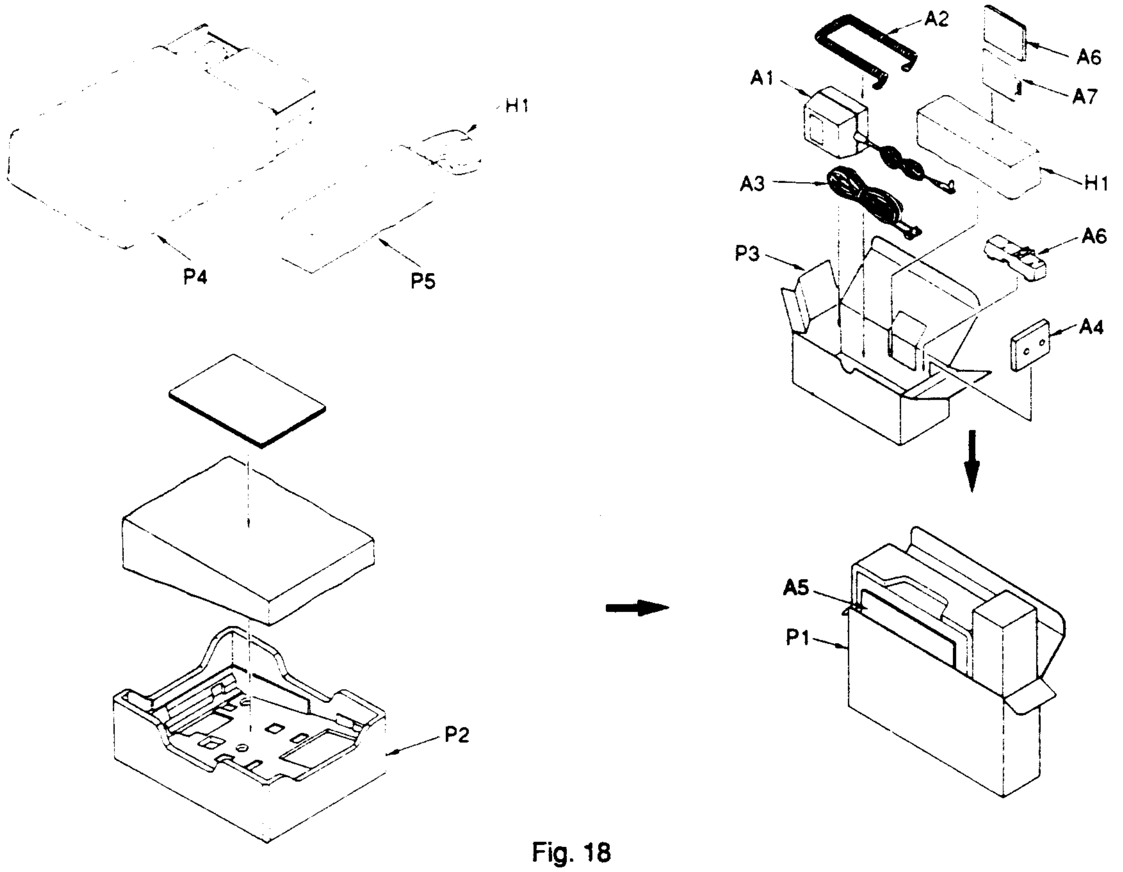

H1
P4
P5
A2
A6
A1
A7
A3
H1
P3
A6
A4
P2
A5
P1

Fig. 18

EXTENSION CORD CONNECTING METHOD

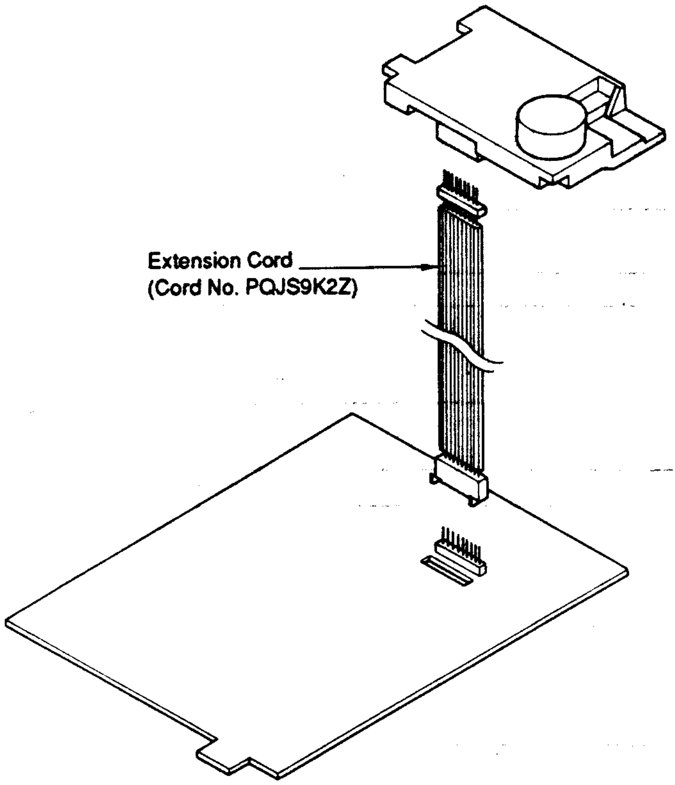

Extension Cord
(Cord No. PQJS9K2Z)

Fig. 19

BLOCK DIAGRAM

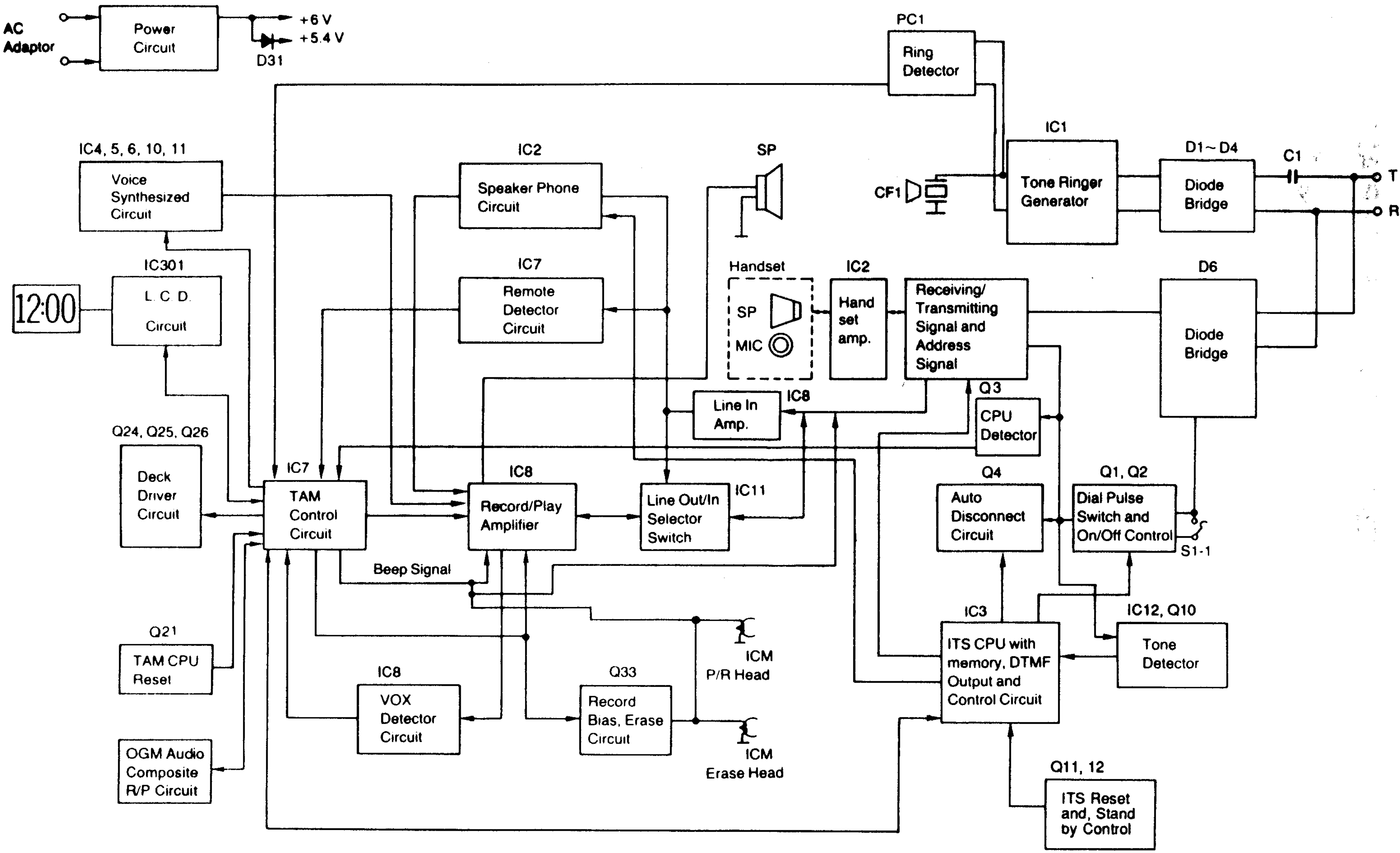
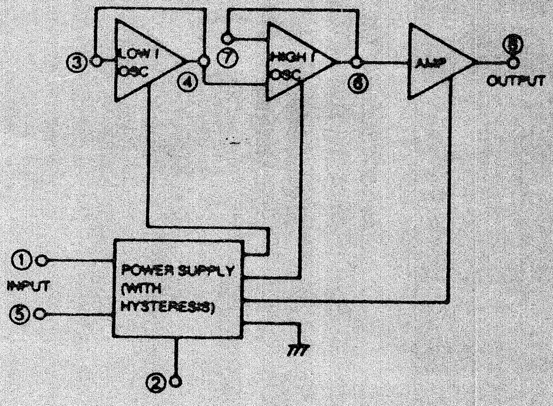

AC Adaptor
Power Circuit
+6 V
+5.4 V
D31
PC1
Ring Detector
IC1
Tone Ringer Generator
D1~D4
Diode Bridge
C1
T
R
CF1
IC4, 5, 6, 10, 11
Voice Synthesized Circuit
IC2
Speaker Phone Circuit
SP
IC301
L. C. D. Circuit
12:00
IC7
Remote Detector Circuit
Handset
SP
MIC
IC2
Hand set amp.
Receiving/ Transmitting Signal and Address Signal
D6
Diode Bridge
IC8
Line In Amp.
Q3
CPU Detector
Q24, Q25, Q26
Deck Driver Circuit
IC7
TAM Control Circuit
IC8
Record/Play Amplifier
IC11
Line Out/In Selector Switch
Q4
Auto Disconnect Circuit
Q1, Q2
Dial Pulse Switch and On/Off Control
S1-1
Beep Signal
IC3
ITS CPU with memory, DTMF Output and Control Circuit
IC12, Q10
Tone Detector
Q21
TAM CPU Reset
ICM
P/R Head
IC8
VOX Detector Circuit
Q33
Record Bias, Erase Circuit
ICM
Erase Head
OGM Audio Composite R/P Circuit
Q11, 12
ITS Reset and, Stand by Control

Fig. 16

IC BLOCK DIAGRAM

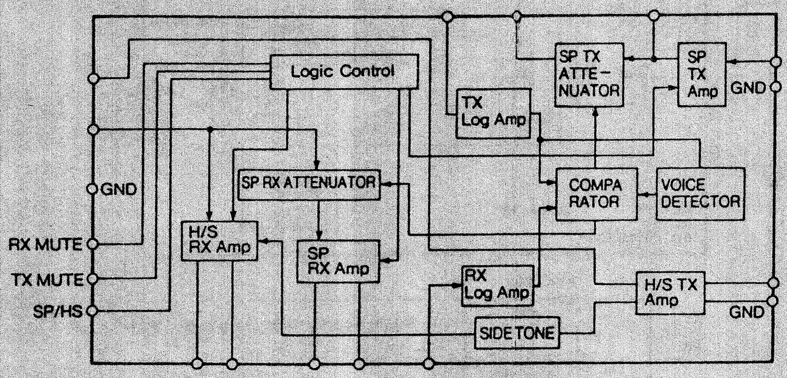
IC1 PQVIBA6565A



③
LOW / OSC
④
⑦
HIGH / OSC
⑥
AMP
⑧
OUTPUT
①
INPUT
⑤
POWER SUPPLY (WITH HYSTERESIS)
②

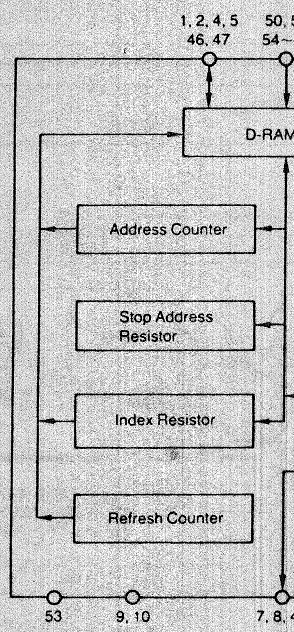
Fig. 9

IC2 PQVISC79054A



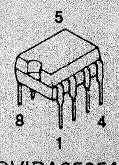
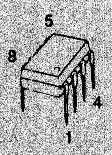
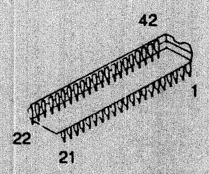
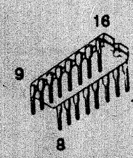
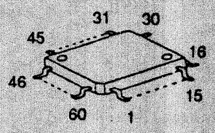
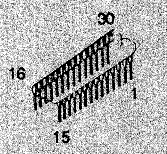
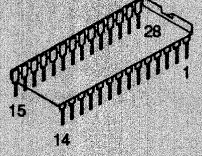
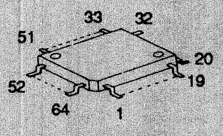
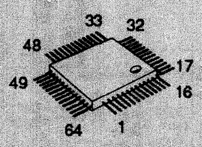
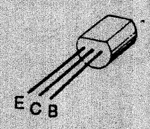
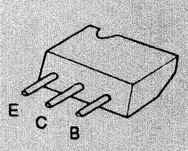
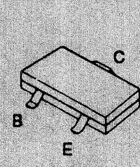
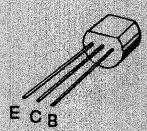
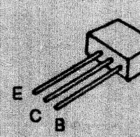
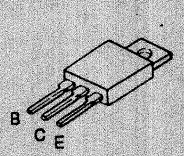
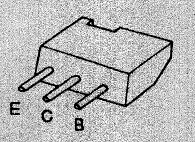
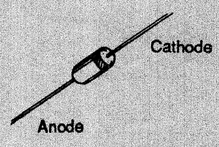
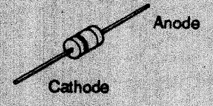
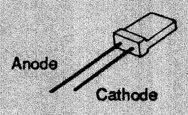
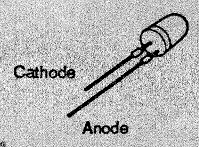
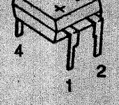
Logic Control
SP TX ATTE-NUATOR
SP TX Amp
TX Log Amp
GND
SP RX ATTENUATOR
COMPA RATOR
VOICE DETECTOR
GND
H/S RX Amp
SP RX Amp
RX MUTE
TX MUTE
SP/HS
RX Log Amp
H/S TX Amp
SIDE TONE
GND

Fig. 10



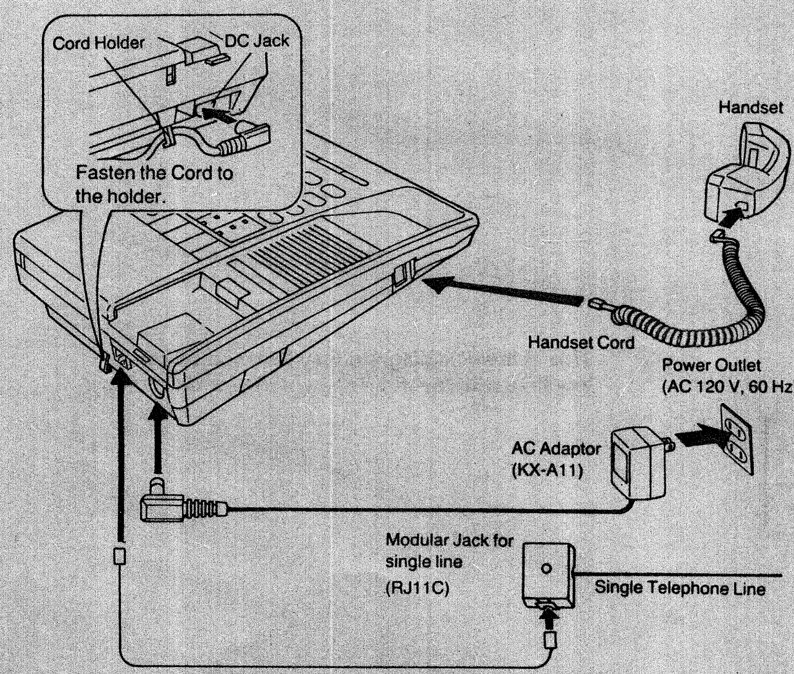
1, 2, 4, 5
46, 47
50, 5
54~
D-RAM
Address Counter
Stop Address Resistor
Index Resistor
Refresh Counter
53
9, 10
7, 8,

TERMINAL GUIDE OF IC's, TRANSISTORS AND DIODES

 PQVIBA6565A PQVIUPC358C	 PQVIBA6220	 MN158413KPC	 PQVITM41256A	 PQVIT6668
 AN6180K	 PQVISC79054A	 PQVI4678A02H PQVI01G114	 PQVIVGH6240A PQVIRMH6240A	 2SA1625
 2SB662B 2SA937	 2SD1819A 2SB1218A	 2SC2120	 2SC3330	 2SD1266
 2SB909M 2SC1652		1SS131 1S1588 1SS119 PQVDMTZ6R8 PQVD05AZ3.0 PQVDHZ2CLL01 MA165	 MA4300 MA4180 MA7051 MA4062	 LN268RPXTAB LN368GPXTAB
 LN28RPL LN28RPXTA3	 PQVDS1YB40F1			

5
8
4
1
42
1
22
21
16
9
1
8
31
30
45
16
46
15
60
1
30
16
1
15
28
1
15
14
33
32
51
20
52
19
64
1
33
32
48
17
49
16
64
1
E
C
B
E
C
B
C
B
E
E
C
B
E
C
B
B
C
E
E
C
B
Cathode
Anode
Anode
Cathode
Anode
Cathode
Cathode
Anode
4
2
1

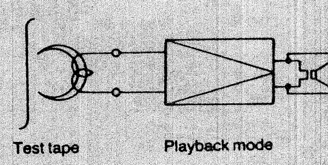
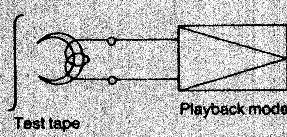
CONNECTION



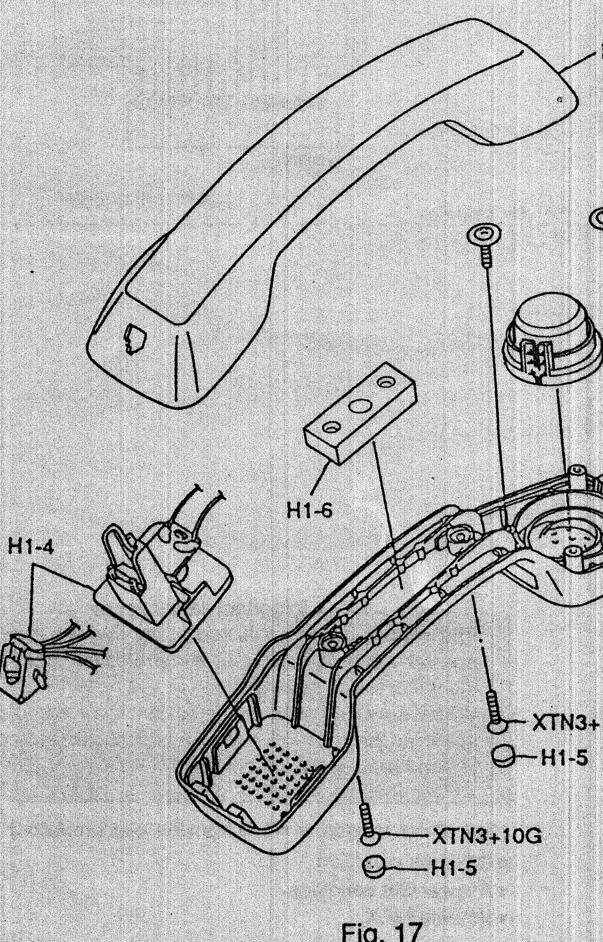
Cord Holder
DC Jack
Fasten the Cord to the holder.
Handset
Handset Cord
Power Outlet (AC 120 V, 60 Hz)
AC Adaptor (KX-A11)
Modular Jack for single line (RJ11C)
Single Telephone Line

MEASUREMENT AND A

Notes:
1. Make sure the heads are clean.
2. Make sure the capstan and pressure roller are clean.
3. Room temperature for measuring and adjusting: 20±5°C (68
4. Test equipments are not treated as replacement parts.

ITEM	MEASUREMENT
1. Head azimuth adjustment	1. Play back the test tape (QZZMW 2. Adjust screw (B) shown in Fig. B (Test equipment connection is sh  Test tape Playback mode
2. Tape speed adjustment	1. Play back the test tape (QZZMW 2. Adjust R330 for 2980~3000 Hz o  Test tape Playback mode

HANDSET P



H1-6
H1-4
XTN3+
H1-5
XTN3+10G
H1-5

Fig. 17

IC4 PQVIT6668

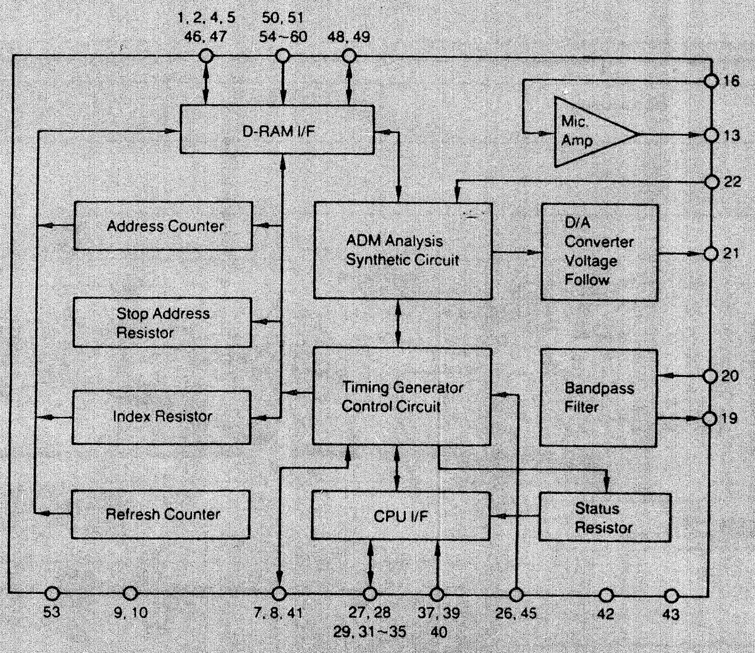

1, 2, 4, 5
46, 47
50, 51
54~60
48, 49
D-RAM I/F
Mic. Amp
16
13
22
Address Counter
ADM Analysis Synthetic Circuit
D/A Converter Voltage Follow
21
Stop Address Resistor
Timing Generator Control Circuit
Bandpass Filter
20
19
Index Resistor
Refresh Counter
CPU I/F
Status Resistor
53
9, 10
7, 8, 41
27, 28
29, 31~35
37, 39
40
26, 45
42
43

Fig. 11

IC5 PQVIVGH6240A

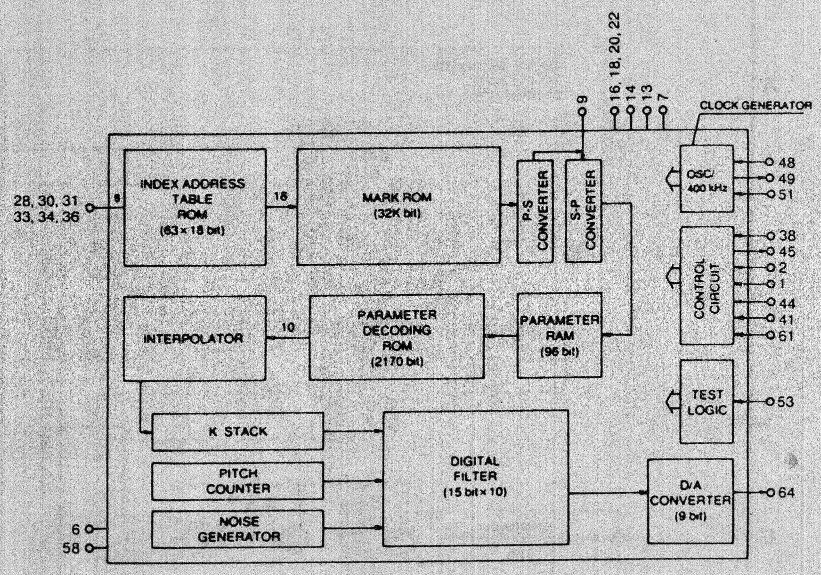
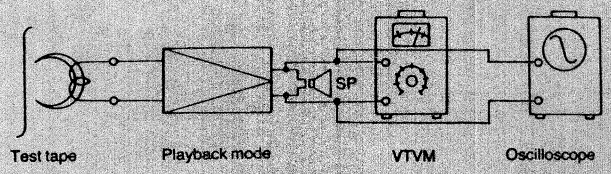
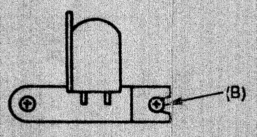
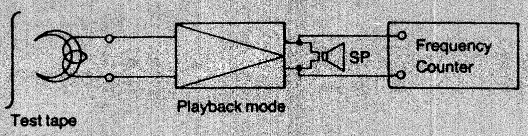

16, 18, 20, 22
9
14
13
7
CLOCK GENERATOR
28, 30, 31
33, 34, 36
8
INDEX ADDRESS TABLE ROM (63 × 18 bit)
18
MARK ROM (32K bit)
P-S CONVERTER
S-P CONVERTER
OSC/ 400 kHz
48
49
51
CONTROL CIRCUIT
38
45
2
1
44
41
61
INTERPOLATOR
10
PARAMETER DECODING ROM (2170 bit)
PARAMETER RAM (96 bit)
TEST LOGIC
53
K STACK
PITCH COUNTER
NOISE GENERATOR
DIGITAL FILTER (15 bit × 10)
D/A CONVERTER (9 bit)
64
6
58

Fig. 12

MEASUREMENT AND ADJUSTMENT METHOD

re the heads are clean.
re the capstan and pressure roller are clean.
mperature for measuring and adjusting: 20±5°C (68±9°F)
ipments are not treated as replacement parts.

	MEASUREMENT & ADJUSTMENT	REMARKS
adjustment	1. Play back the test tape (QZZMWA). 2. Adjust screw (B) shown in Fig. B for maximum output at SP terminal. (Test equipment connection is shown below.)  SP Test tape Playback mode VTVM Oscilloscope	* Record/playback head  Fig. B
justment	1. Play back the test tape (QZZMWA). 2. Adjust R330 for 2980~3000 Hz on frequency counter reading.  SP Frequency Counter Test tape Playback mode	

HANDSET PARTS LOCATION

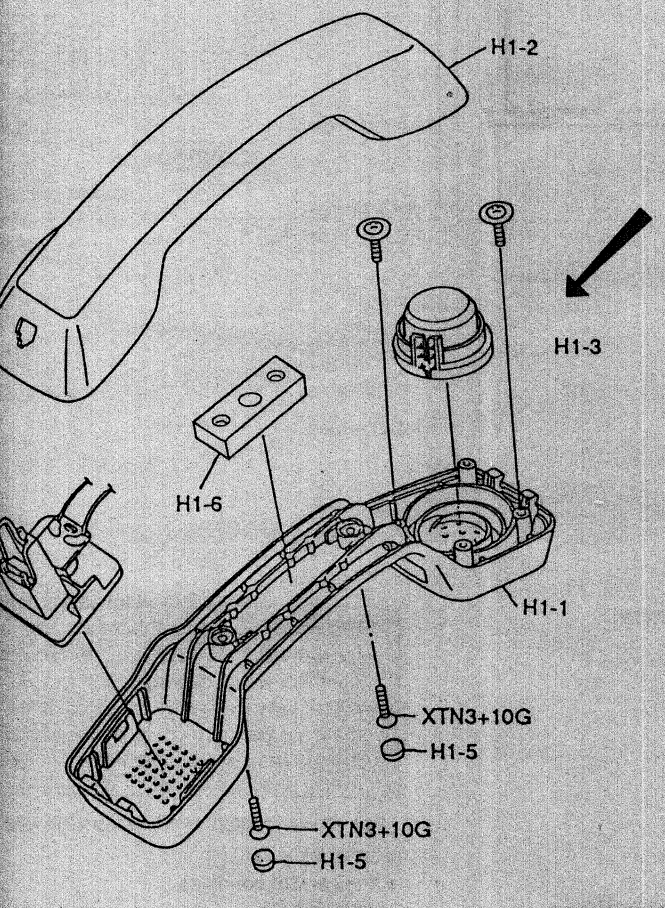
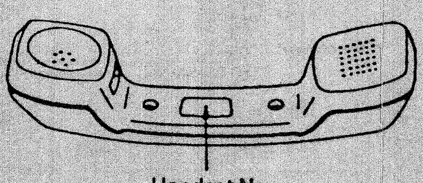
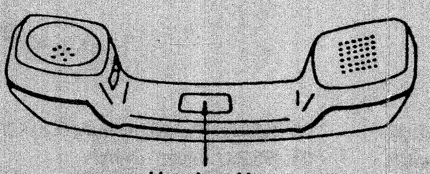

H1-2
H1-3
H1-6
H1-1
XTN3+10G
H1-5
XTN3+10G
H1-5

Fig. 17



Handset No.
JX2PV407ZA



Handset No.
JX2PV408ZA
(Can't be disassembled)

IC6 PQVIRMH6240A

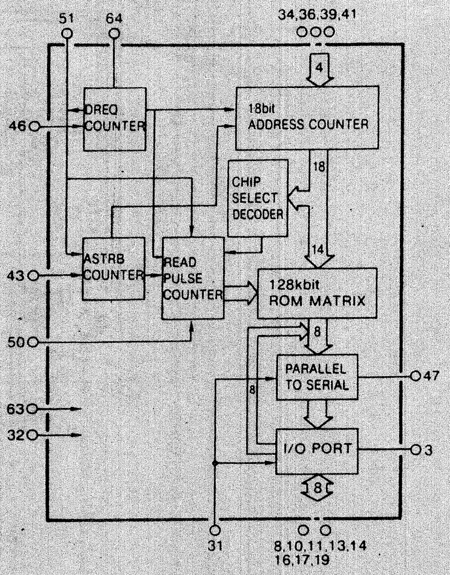

51
64
34,36,39,41
4
46
DREQ COUNTER
18bit ADDRESS COUNTER
18
CHIP SELECT DECODER
14
43
ASTRB COUNTER
READ PULSE COUNTER
128kbit ROM MATRIX
8
50
PARALLEL TO SERIAL
47
8
63
32
I/O PORT
3
8
31
8,10,11,13,14
16,17,19

Fig. 13

IC7 AN6180K

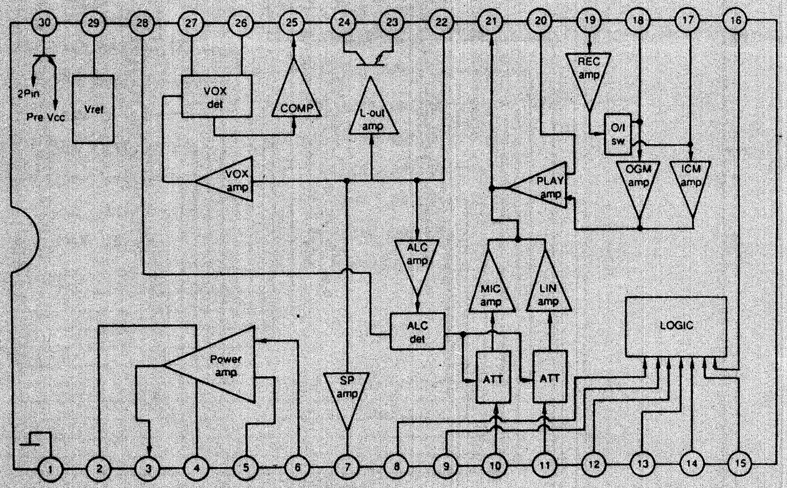

30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
2Pin
Pre Vcc
Vref
VOX det
COMP
L-out amp
REC amp
O/I sw
VOX amp
PLAY amp
OGM amp
ICM amp
ALC amp
MIC amp
LIN amp
ALC det
LOGIC
Power amp
SP amp
ATT
ATT
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

Fig. 14

IC10, 11 PQVITM41256A

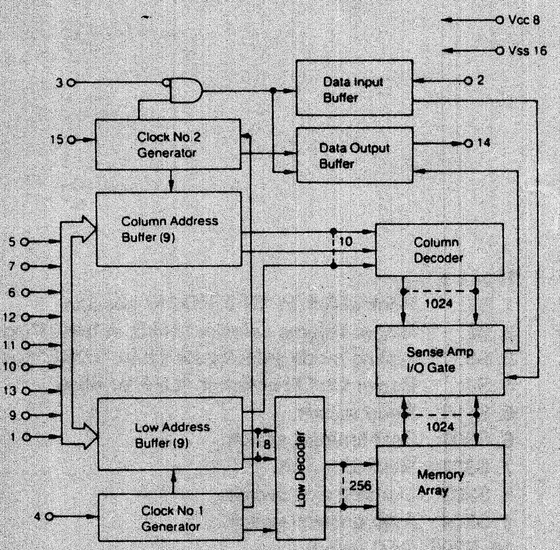
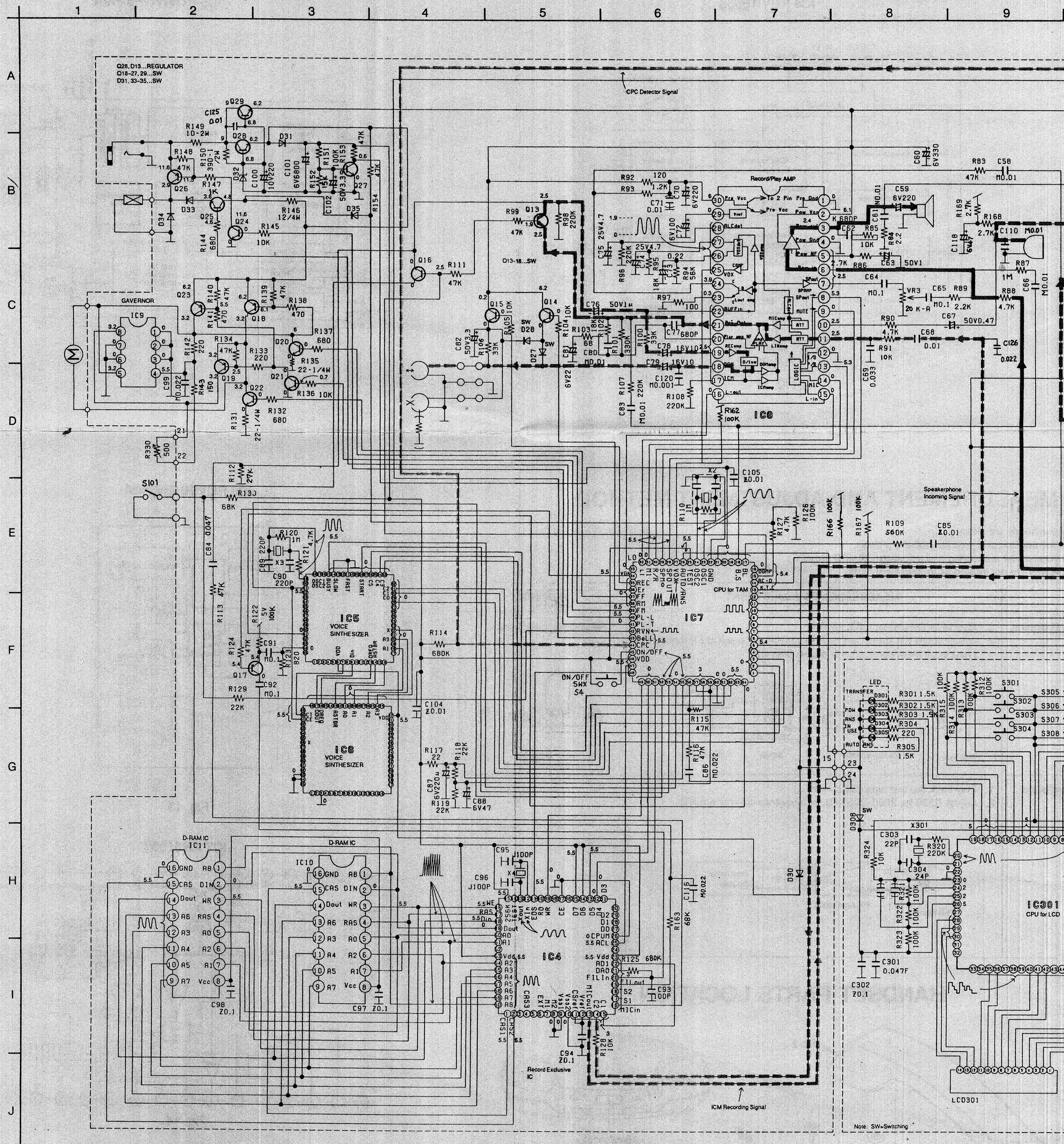

Vcc 8
Vss 16
3
Data Input Buffer
2
15
Clock No 2 Generator
Data Output Buffer
14
Column Address Buffer (9)
10
Column Decoder
5
7
6
12
11
10
13
9
1
1024
Sense Amp I/O Gate
1024
Low Address Buffer (9)
8
Low Decoder
256
Memory Array
4
Clock No 1 Generator

Fig. 15

SCHEMATIC DIAG


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
Q28, D13...REGULATOR
Q16~27, 29...SW
D31, 33~35...SW
GAVERNOR
IC9
M
S101
CPC Detector Signal
Record/Play AMP
IC8
Q13~16...SW
IC5
VOICE SINTHESIZER
IC6
VOICE SINTHESIZER
IC7
CPU for TAM
ON/OFF SW
S4
Speakerphone Incoming Signal
D-RAM IC
IC11
IC10
IC4
Record Exclusive IC
ICM Recording Signal
IC301
CPU for LCD
LCD301
LED
TRANSFER
Note: SW=Switching

Notes:

1. S1: Hook switch in "OFF-HOOK" position.
2. S2: Ringer volume selector switch in "HIGH" position.
3. S3: Dialing mode selector switch in "TONE" position.
4. S4: Power On/Off switch in "OFF"position.
5. S100: Reed switch.
6. S301: Fast forward switch.
7. S302: Rewind switch.
8. S303: Memo/2 way switch.
9. S304: Auto answer switch.
10. S305: REC switch.
11. S306: Playback switch.
12. S307: OGM play switch.
13. S308 Announce switch.
14. S309: ICM erase switch.
15. S310~ 319, 321: Dialing switch.
16. S320: Tone switch.
17. S322: Lower switch.
18. S323: Redial switch.
19. S324 Pause switch.
20. S325: Speakerphone On/Off switch.
21. S326: Mute switch.
22. S327: Hold switch.
23. S328: Flash switch.
24. S329: Auto switch.
25. S330: Program switch.
26. S331, 333 ,334: Direct call switch.
27. S332: Memo switch.
28. S335: Clear switch.
29. S336: Transfer switch.
30. DC voltage measurement are taken with an electronic voltmeter from negative line.

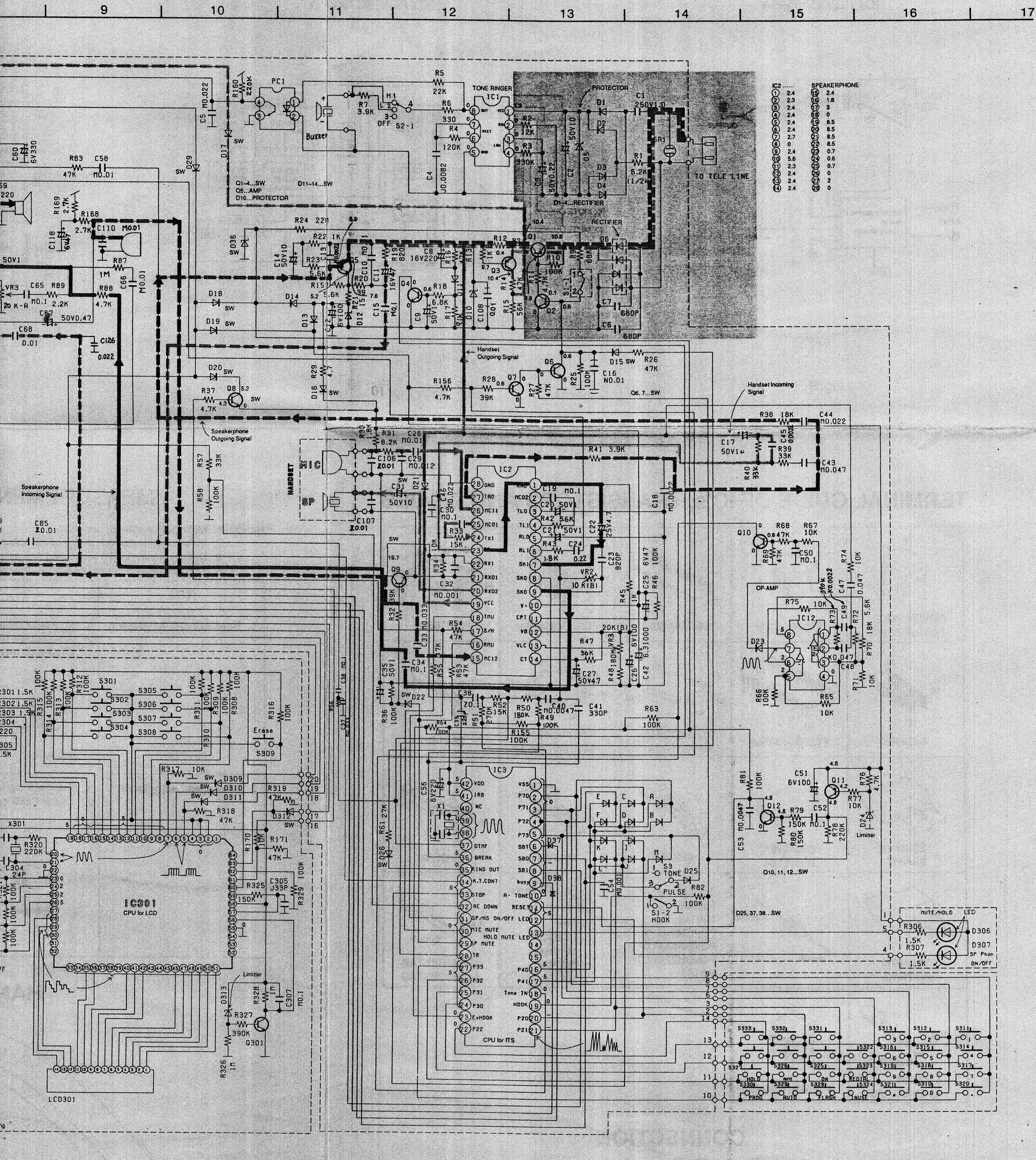
Important safety noti

The shaded area on this schematic di
special features important for protec
electrical shock hazards.
When servicing it is essential that o
specified parts be used for the critical
shaded area of the schematic.

(Add 40 mA to telephone line from the loop

- Off-hook condition
- Answer Set condition
- Volume MAX.

CHEMATIC DIAGRAM


9
10
11
12
13
14
15
16
17
PC1
Buzzer
H1
S2-1
OFF
TONE RINGER
IC1
PROTECTOR
TO TELE LINE
SA1
D1-4...RECTIFIER
RECTIFIER
Q1-4...SW
Q5...AMP
D10...PROTECTOR
D11-14...SW
Handset Outgoing Signal
Handset Incoming Signal
Speakerphone Outgoing Signal
Speakerphone Incoming Signal
Q6, 7...SW
HANDSET
MIC
SP
IC2
OP-AMP
IC12
Limiter
Q10, 11, 12...SW
IC3
CPU for ITS
IC301
CPU for LCD
LCD301
X301
X1
Erase
S3 TONE PULSE
S1-2 HOOK
D25, 37, 38...SW
MUTE/HOLD
LED
D306
D307
SP Phon ON/OFF
HOLD
PROG
AUTO
FLASH
REDIAL
PAUSE

IC2		SPEAKERPHONE	
①	2.4	⑮	2.4
②	2.3	⑯	1.6
③	2.4	⑰	3
④	2.4	⑱	0
⑤	2.4	⑲	8.5
⑥	2.4	⑳	8.5
⑦	2.7	㉑	8.5
⑧	0	㉒	8.5
⑨	2.4	㉓	0.7
⑩	5.6	㉔	0.6
⑪	2.3	㉕	0.7
⑫	2.4	㉖	0
⑬	2.4	㉗	2
⑭	2.4	㉘	0

Important safety notice

shaded area on this schematic diagram incorporates ial features important for protection from fire and rical shock hazards.

n servicing it is essential that only manufacturer's ified parts be used for the critical components in the ed area of the schematic.

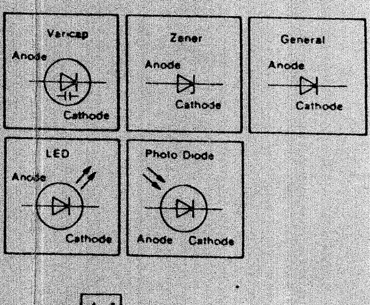
mA to telephone line from the loop simulator.)

ok condition

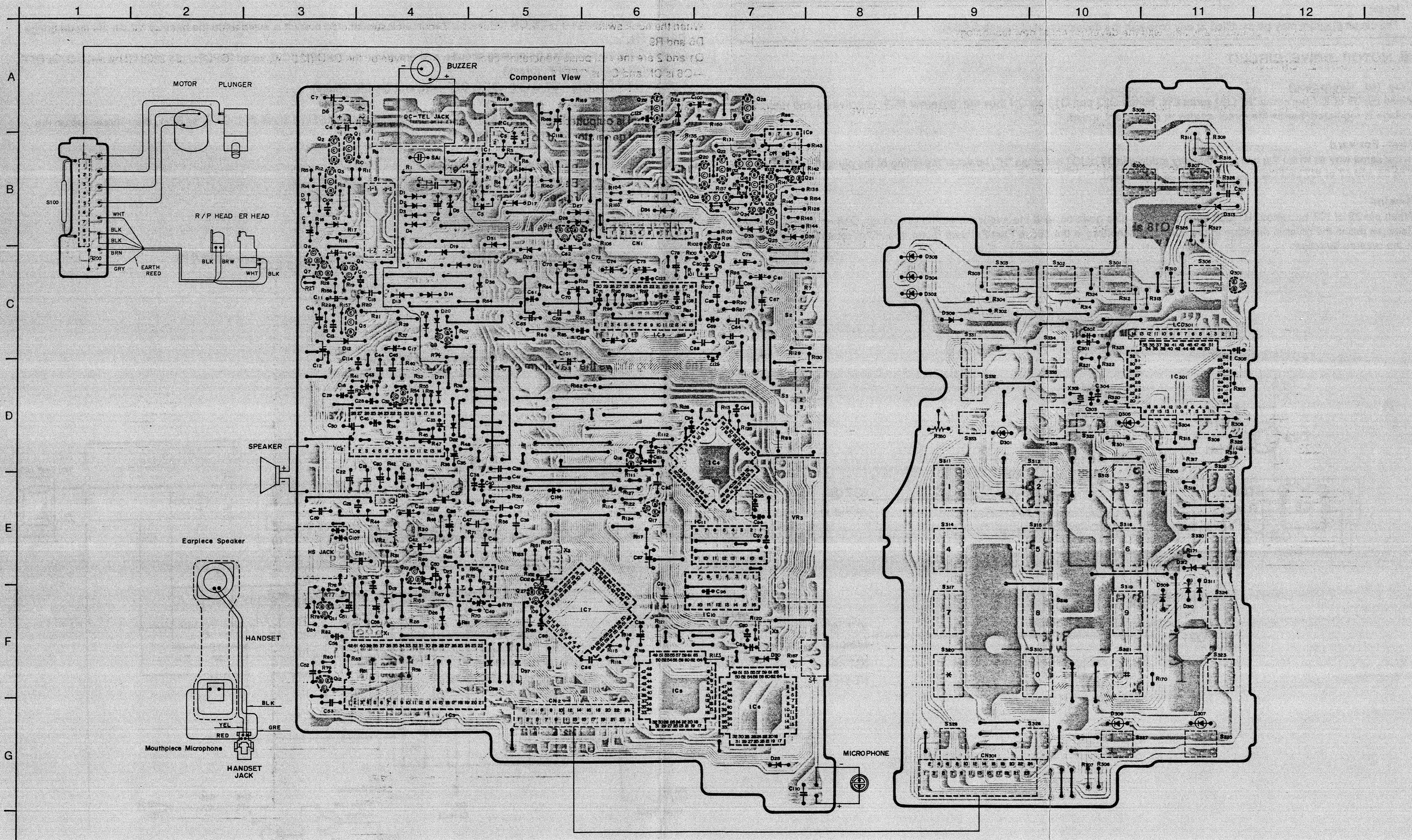
r Set condition

e MAX.

This schematic diagram may be modified at any time with the development of new technology.


Varicap
Anode
Cathode
Zener
Anode
Cathode
General
Anode
Cathode
LED
Anode
Cathode
Photo Diode
Anode
Cathode

CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM


1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
BUZZER
Component View
MOTOR
PLUNGER
S100
WHT
BLK
BLK
BRN
GRY
EARTH REED
R/P HEAD
ER HEAD
BLK
BRW
WHT
BLK
DC-TEL JACK
CN1
CN2
IC7
VR3
SPEAKER
Earpiece Speaker
HS JACK
HANDSET
BLK
YEL
GRE
RED
Mouthpiece Microphone
HANDSET JACK
MICROPHONE
LCD301
IC501
CN301

H

Note:
This circuit board may be modified at any time with the development of new technology.

CIRCUIT OPERATION

Note:
The circuit diagram may be modified at any time with the development of new technology.

■ MOTOR DRIVE CIRCUIT

Play (or Recording)

When pin 39 of IC7 becomes "H" Q21 turns ON, hence Q23 and Q19 go ON thus the governor (IC9) is activated and the motor voltage is regulated, hence the motor rotates at a constant speed.

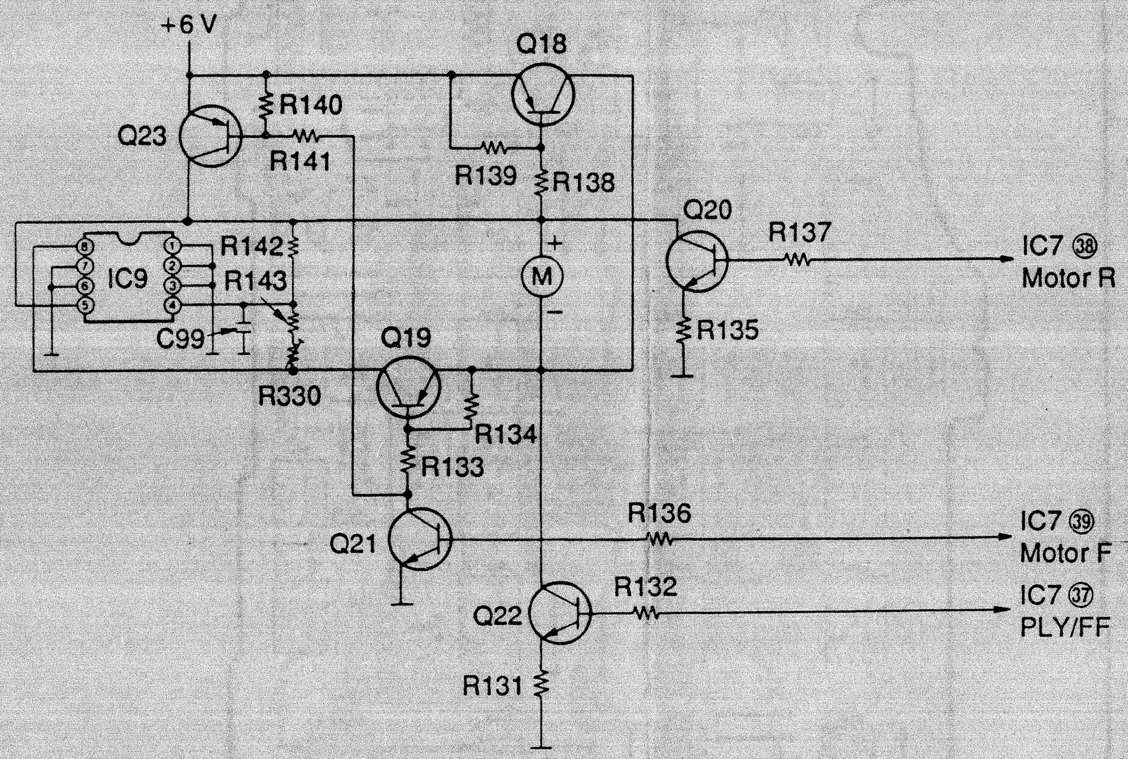
First Forward

In the same way as when the unit is in the play mode, pin 39 of IC7 becomes "H", however the timing of the plunger is changed by pins 55 and 57 of IC7 and the motor is rotated at high speed.

Rewind

When pin 38 of IC7 becomes "H" Q20 goes ON. Q18 also goes on, and the motor current flows through Q18 → Motor → Q20. Because this is the reverse direction to the current which flows in the above Fast Forward mode, the motor rotates at high speed in the reverse direction.

Circuit Diagram


+6 V
Q18
Q23
R140
R141
R139
R138
Q20
R137
IC7 ㊳
Motor R
IC9
R142
R143
C99
M
+
-
R135
Q19
R330
R134
R133
Q21
R136
IC7 ㊴
Motor F
Q22
R132
IC7 ㊲
PLY/FF
R131

■ TELEPHONE LINE INTERFACE

When the hook switch S1-1 is ON (off-hook), the circuit is closed, and current is supplied to the base of Q2 via the diode bridge D6 and R9.
Q1 and 2 are the dial pulse generating circuits, and are driven by the CPU (IC3), when the CPU pin 36 is ON (Low)→Q7 is OFF →Q6 is ON and Q1 is OFF. (break)
If pin 36 is OFF (High)→Q7 is ON→Q6 is OFF→Q2 and Q1 ON. (make)

The ring signal is outputted from pin 8 of IC1, and its volume is adjusted in 3 steps (H-L-OFF) by S2-1, then impressed on the ceramic sound generator, and so is generated.

R2 .... Bell sensitivity adjustment
R4, C4 .... Bell frequency setting fH1, fH2
R3, C3 .... Repeat frequency setting fL

fH1, fH2, fL are derived from the following formula:

$$fH1 = \frac{1}{1.227 \times R4 \times C4} = 828\ \text{Hz} \qquad fL = \frac{1}{1.273 \times R3 \times C3} = 10.8\ \text{Hz}$$

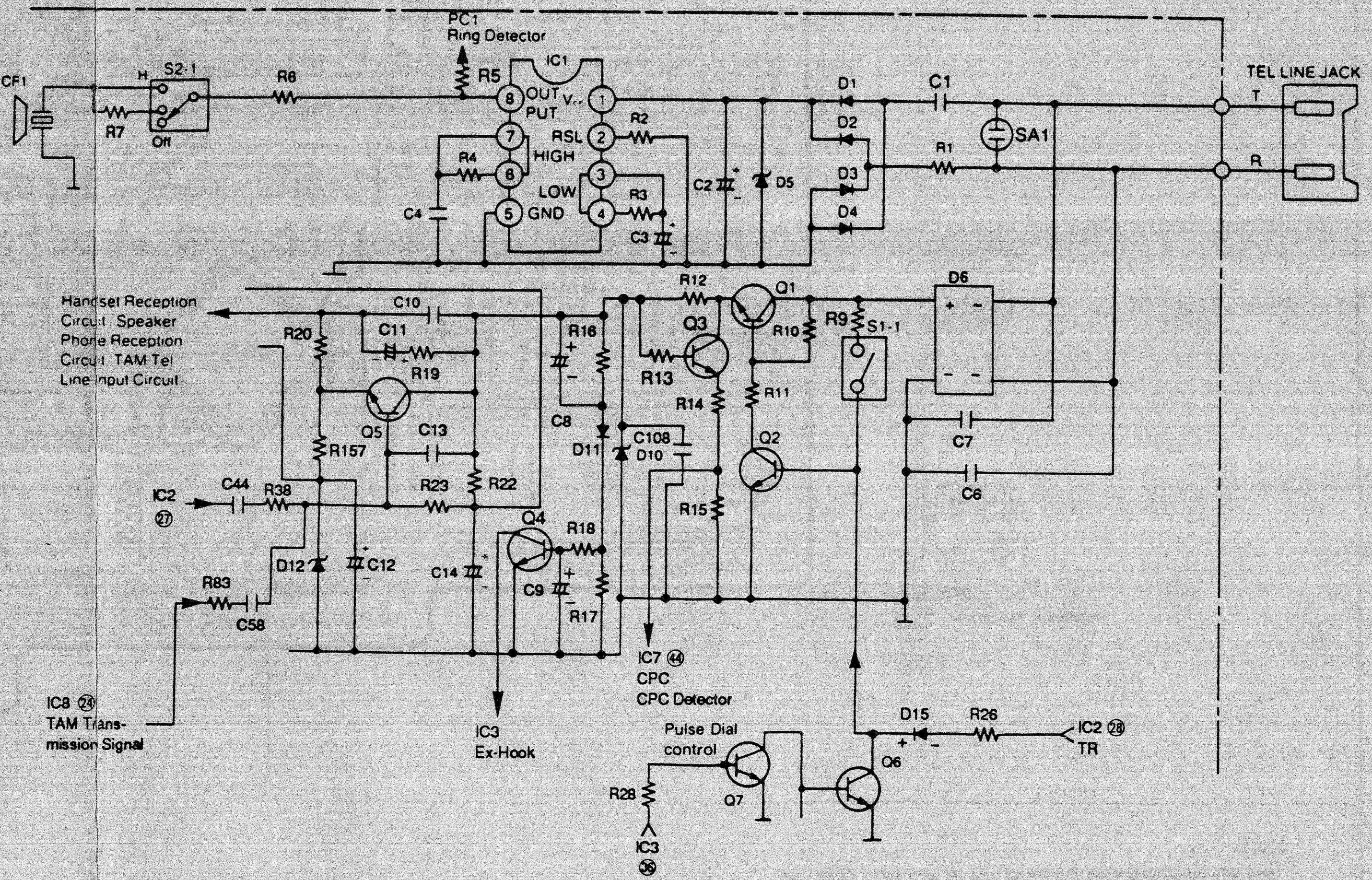
R4 = 120 K
C4 = 0.0082 μF

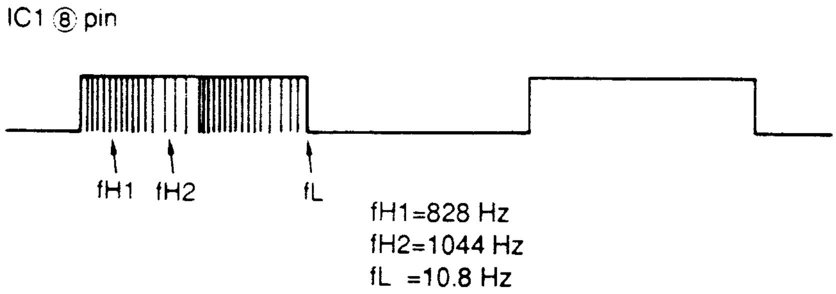
R3 = 330 K
C3 = 0.22 μF

fH2 = 1.26 X fH1 = 1044 Hz

The following shows the waveform of the tone ringing IC output:

Circuit Diagram


PC1
Ring Detector
CF1
H
S2-1
R7
Off
R6
R5
IC1
8 OUT PUT
V..
1
7
6
HIGH
5 GND
LOW
RSL 2
3
4
R4
C4
R2
R3
C3
C2
D5
D1
D2
D3
D4
C1
R1
SA1
TEL LINE JACK
T
R
Handset Reception Circuit Speaker Phone Reception Circuit TAM Tel Line Input Circuit
C10
C11
R19
R20
Q5
C13
R157
R23
R22
IC2 ㉗
C44
R38
D12
C12
C14
Q4
R18
C9
R17
R83
C58
IC8 ㉔
TAM Trans-mission Signal
IC3
Ex-Hook
R16
C8
D11
C108
D10
R12
Q3
R13
R14
Q1
R10
R11
R9
S1-1
D6
C7
C6
Q2
R15
IC7 ㊹
CPC
CPC Detector
Pulse Dial control
R28
Q7
IC3
㊱
Q6
D15
R26
IC2 ㉘
TR

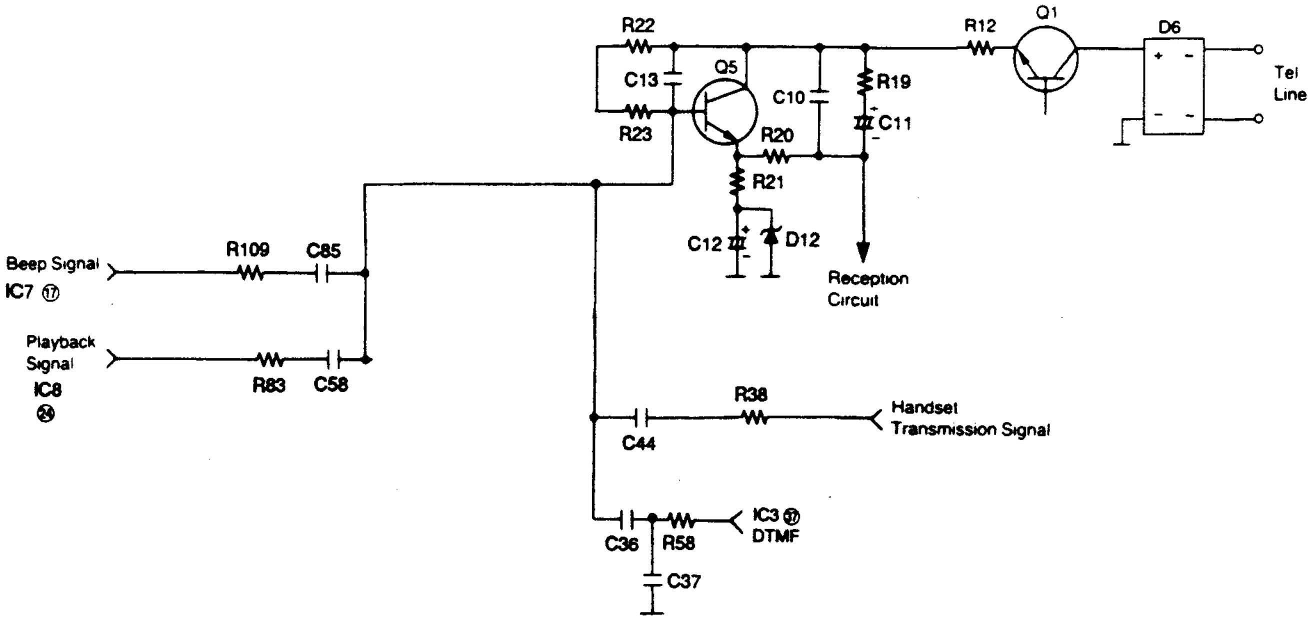


■ LINE OUTPUT CIRCUIT

Each signals are sent to the telephone line as follows.

- (Beep Tone) pin 17 of IC7 → R109 → C85
- (Tape Playback Signal) pin 24 of IC8 → R83 → C58
- (Handset Transmission Signal) Handset Mic → R38 → C44 → base of Q5 → collector of Q5 → R12 → Q1 → D6 → Telephone Line.
- (DTMF, Hold Tone) pin 37 of IC3 → R58 → C36

Circuit Diagram


R22
C13
Q5
R23
C10
R19
C11
R20
R21
C12
D12
R12
Q1
D6
Tel Line
Reception Circuit
Beep Signal IC7 ⑰
R109
C85
Playback Signal IC8 ㉔
R83
C58
R38
Handset Transmission Signal
C44
C36
R58
C37
IC3 ㊲ DTMF

■ RING DETECTOR CIRCUIT

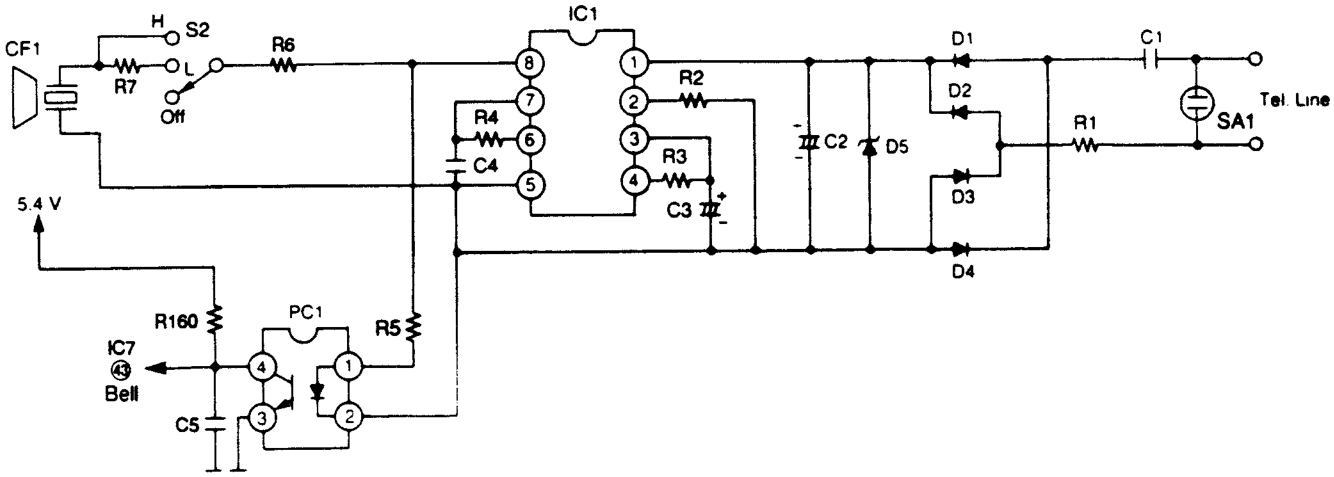
Function:

This circuit activates the CPU to respond to the ring signal from the telephone line during the ANSWER mode of operation.

Circuit Operation:

When a Ring Signal is inputted from the telephone line, a tone (ring signal) will be outputted from IC1 pin 8. (See telephone line interface.)
This ring signal flows through R5→PC1 pin 1→PC1 pin 2, hence photocoupler→PC1 pin 4-3 will turn ON.
As a result, IC7 pin 43 goes Low, indicating that Ring Signal was inputted.

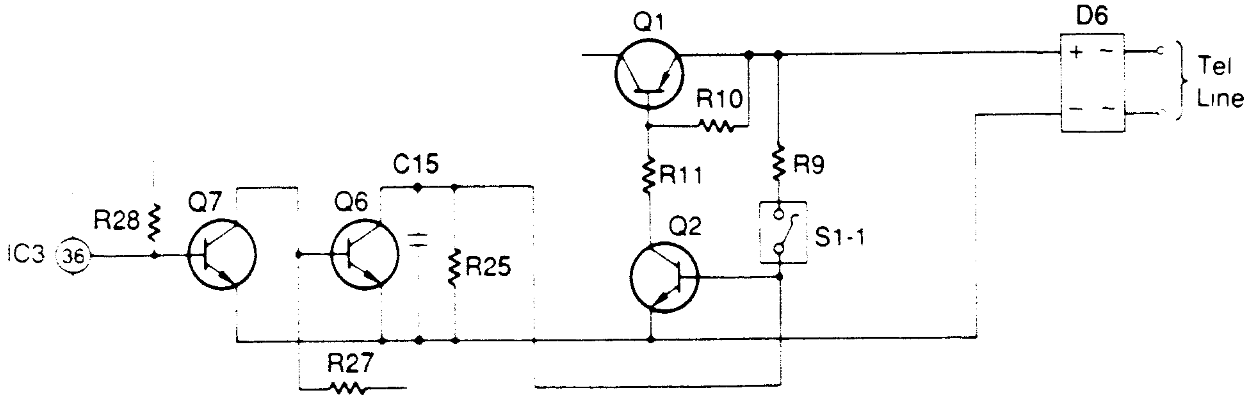
Circuit Diagram


IC1
H
S2
CF1
R6
R7
L
Off
8
7
6
5
1
2
3
4
R2
R4
C4
R3
C3
C2
D5
D1
D2
D3
D4
C1
R1
SA1
Tel. Line
5.4 V
R160
PC1
R5
IC7
43
Bell
C5

■ PULSE DIAL CIRCUIT

Circuit Operation:

The dial pulses are generated by the CPU (IC3), and reach the telephone line via the following path; Pin 36 of IC3→Q7→Q6→Q2→R11→Q1→D6→telephone line.


Q1
D6
+ −
− −
Tel
Line
R10
R11
R9
C15
Q7
Q6
R28
IC3
36
R25
Q2
S1-1
R27

■ TONE DIAL CIRCUIT

Function:

The tone dialing circuit consists of a DTMF (Dual Tone Multi Frequency) signal generator (outputted from pin 16 of the microprocessor) for tone dialing, and also a circuit of outputting the signal to line.
The DTMF circuit identifies inputs from 12 keys (1, 2, 3, 4, 5, 6, 7, 8, 9, 0, *, and #) by means of a total of seven frequencies, that is four low frequencies (Low group) and three high frequencies (High group).

Circuit Operation:

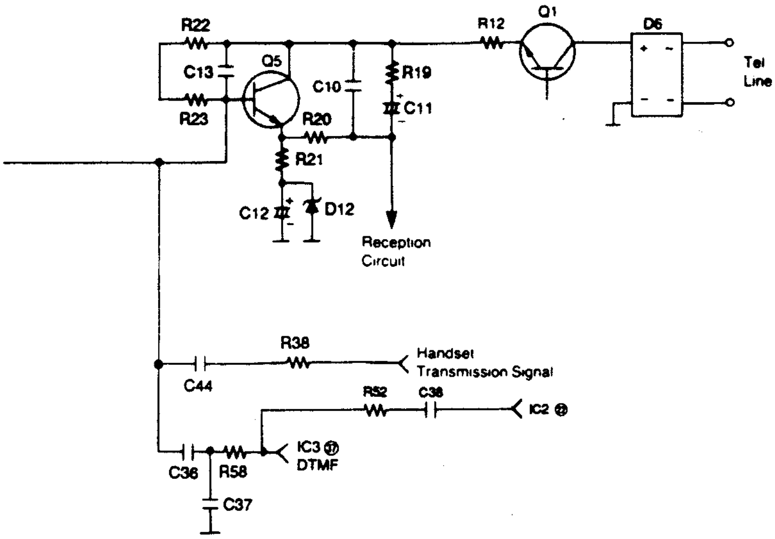
When a dial key is pressed, a DTMF signal is outputted from pin 37 of IC1 as an analog synthetic wave.
The signal flow to the line is as follows.
Pin 37 of IC1→R58, C36→Q5 base→Q5 collector→R12→Q1→D6→Line.
Q5 is an amplifier which is used to output the signal to the line.
Shown below is the signal flow used to output the DTMF signal from the handset as a monitor tone when a dial key is pressed.
The circuit flow is as follows:
Pin 37 of IC3→R52→C38→pin 2 of IC2→pin 21 of IC2→Handset Speaker.
The signal combination and frequency corresponding to each dial key is shown below.

Tone Frequencies

High Group Low Group	H1	H2	H3
L1	1	2	3
L2	4	5	6
L3	7	8	9
L4	•	0	#

Low Group	Frequencies	High Group	Frequencies
L1	697 Hz± 1.5%	H1	1209 Hz± 1.5%
L2	770 Hz± 1.5%	H2	1336 Hz± 1.5%
L3	852 Hz± 1.5%	H3	1477 Hz± 1.5%
L4	941 Hz± 1.5%		

Circuit Diagram

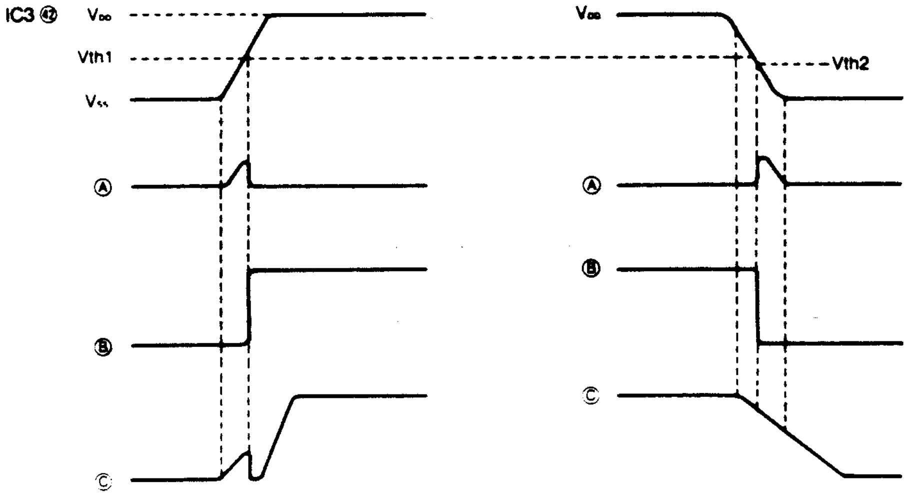

R22
C13
R23
Q5
C10
R19
C11
R20
R21
C12
D12
Reception Circuit
R12
Q1
D6
Tel Line
R38
Handset Transmission Signal
C44
R52
C38
IC2 ②
C36
R58
IC3 ㊲
DTMF
C37

■ ITS RESET AND STAND BY CONTROL CIRCUIT

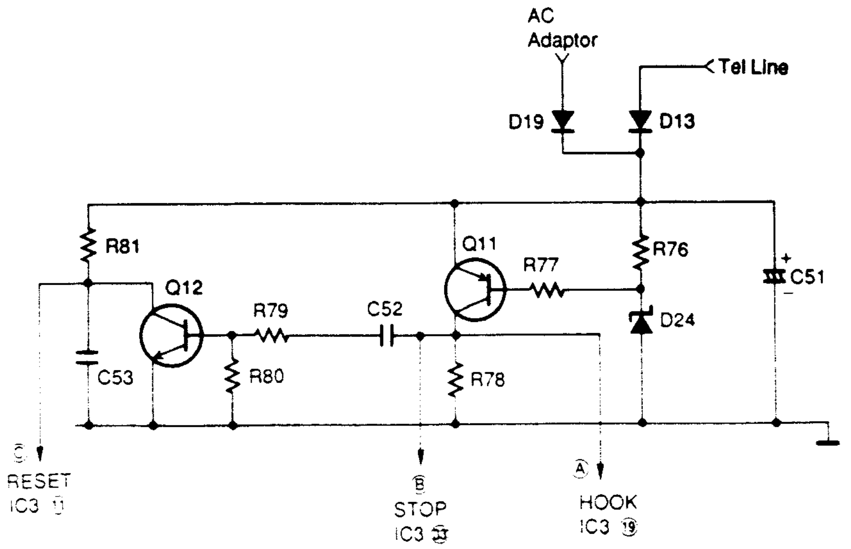
Function:
In order to hold the contents of the memory of IC3, the unit is designed so that it goes into the Stop mode when the power is cut off (memory backup mode: CPU clock stops in order to reduce power consumption).

Circuit Operation:
Timing charts Ⓐ to Ⓒ are shown.

1) When the power is switched ON, the voltage will gradually rise until it reaches Vth1, whereupon IC3 pin 11 input port changes from a "L"→"H", and a reset is applied. Simultaneously, a "L" is inputted to IC3 pin 33 the stop input port, causing the stop mode to be cleared.
2) When the power is cut off, the voltage falls until it reaches Vth2, whereupon a "H" is inputted to IC3 pin 33, and IC3 enters the stop mode to reduce power consumption, so that only memory hold current is supplied.


1) When the power is switched on. 2) When the power is cut off.

Circuit Diagram


AC Adaptor
Tel Line
D19
D13
R81
Q11
R77
R76
C51
Q12
R79
C52
D24
C53
R80
R78
Ⓒ RESET IC3 ⑪
Ⓑ STOP IC3 ㉝
Ⓐ HOOK IC3 ⑲

■ HANDSET TRANSMISSION, RECEPTION AND DTMF SIGNAL OUTPUT CIRCUIT

Operation:

- Transmission
  Handset Microphone → pin 26 of IC2 → pin 25 of IC2 → pin 24 of IC2 → pin 19 of IC2 →Q1 → D6 → Telephone Line.

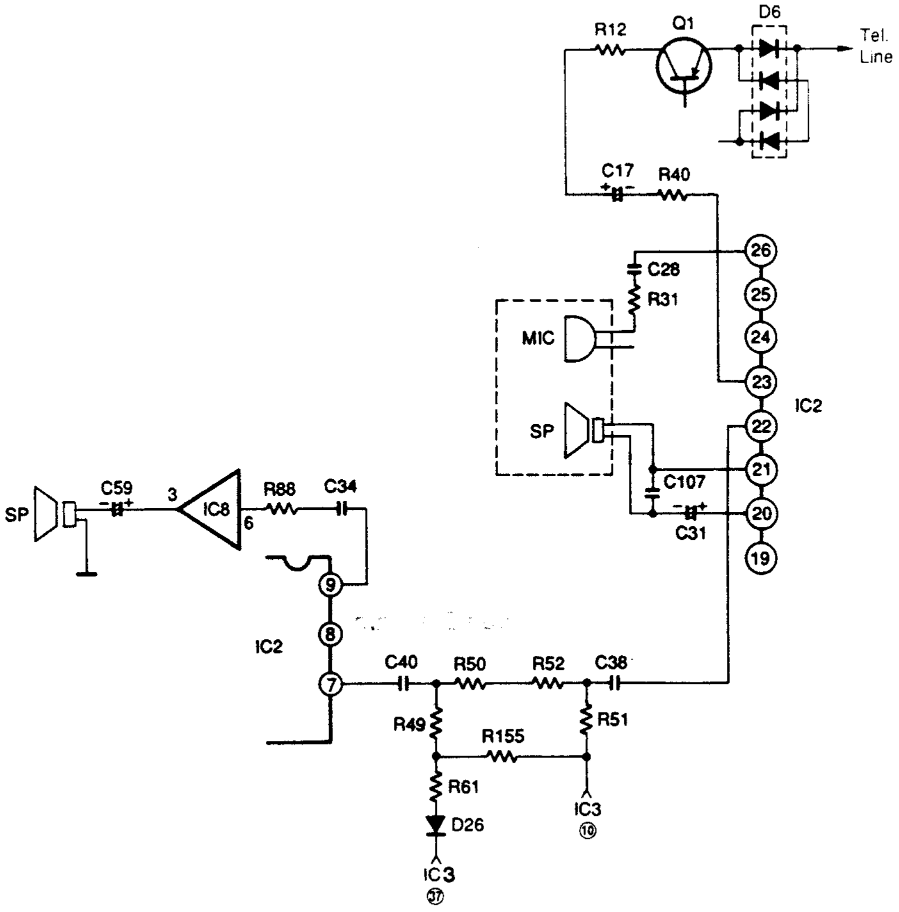
- Reception
  Telephone Line → D6 → Q1 → C17 → R40 → pin 23 of IC2 → pin 21 of IC2 → Handset Speaker.
  ↳ pin 22 of IC2

- DTMF and Audible Tone

CPU(IC3) → R52 (DTMF) / R51 (Audible) → C38 → pin 22 of IC2 → pin 21 of IC2 → Handset Speaker.
↳ pin 22 of IC2

CPU(IC3) → R50 (DTMF) / R155 (Audible) → C40 → pin 7 of IC2 → pin 9 of IC2 → Speaker.

Circuit Diagram

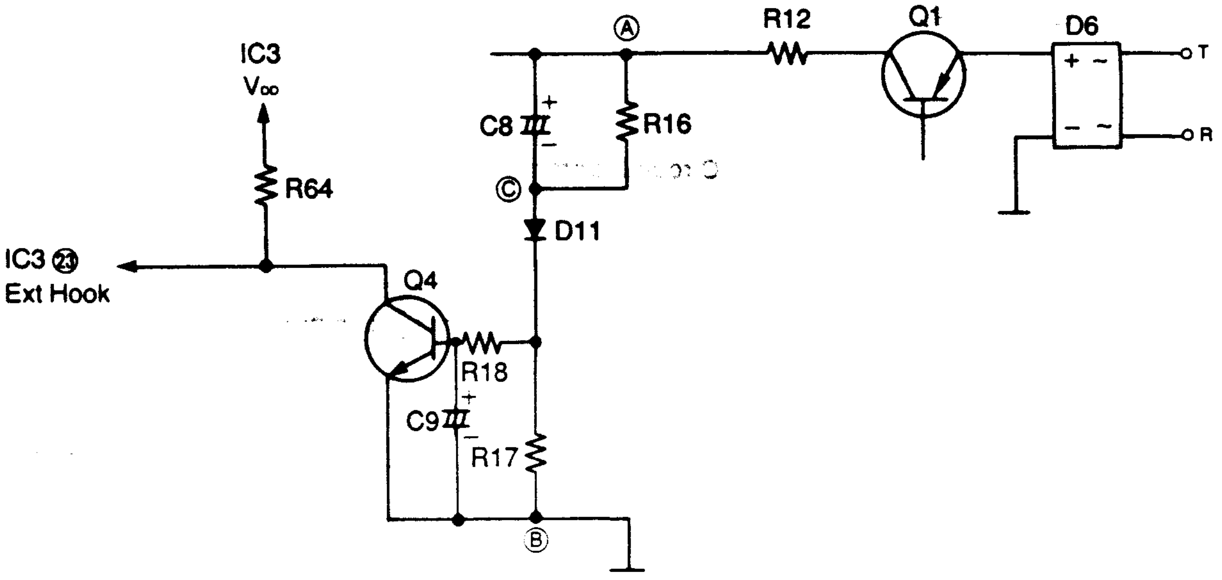

R12
Q1
D6
Tel. Line
C17
R40
C28
R31
MIC
SP
26
25
24
23
22
21
20
19
IC2
C107
C31
SP
C59
3
IC8
6
R88
C34
9
8
7
IC2
C40
R50
R52
C38
R49
R155
R51
R61
D26
IC3
37
IC3
10

■ CLEARING THE HOLD STATUS AND AUTO DISCONNECT CIRCUIT

Function:
When line recording is taking place in the Hold status or a TAM ANSWER status, this unit will detect the OFF-Hook status of another telephone connected in parallel with the line and then clear the Hold status, and stops recording.

Circuit Operation:
Whe the unit seizes a line a voltage will be applied between points Ⓐ and Ⓑ. At this time a voltage will be applied to the base Q4, causing Q4 to turn ON. As a result, the collector of Q4 will go Low, and a Low status will be inputted to IC3 pin 23, thus detecting the fact that the unit has seized the line. Then, when the parallel-connected telephone hoes into an OFF-Hook status, the voltage between Ⓐ and Ⓑ will fall. However, the charge on C8 causes the previous voltage between Ⓐ and Ⓒ to be retained, hence the voltage between Ⓒ and Ⓑ falls. Consequently, the base potential of Q4 falls, causing Q4 to turn OFF and IC3 pin 23 to go High, thus detecting the fact that the parallel-connected telephone is in an OFF-Hook status.

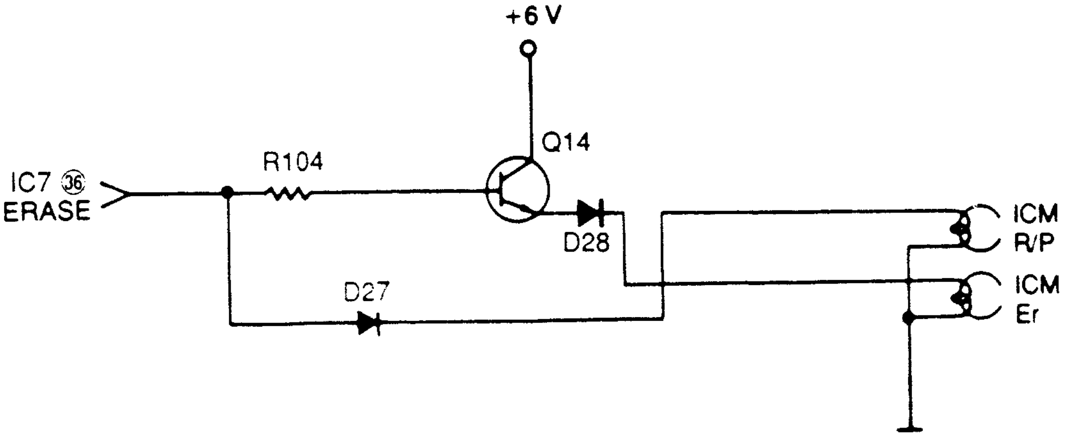
Circuit Diagram



■ QUICK ERASE CIRCUIT

Circuit Operation:
When the Erase Switch is turned on, DC current flows as follows;
IC7 pin 36 (High level)→R104→Q14 (ON)→D28→ICM Erase Head
→ D27 → ICM R/P Head

Circuit Diagram

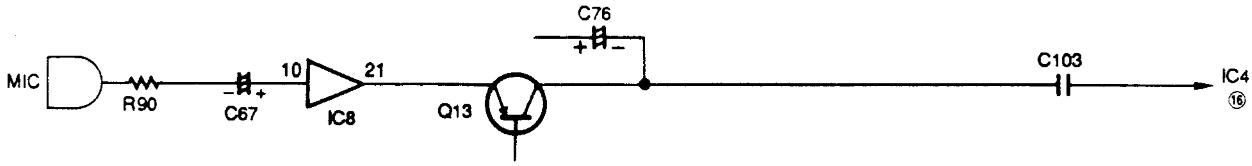


■ OGM SYNTHESIZED VOICE RECORDING/PLAYBACK CIRCUIT

IC4 is a LSI chip for voice recording/playback. IC10 and IC11 are dynamic RAM and are used to store the voice data.
When recording, IC4 changes the voice signals to digital data and stores the data on IC10 and IC11. When playing back, IC4 has access to the data recorded on IC10 and IC11, and synthesizes the voice signal from the data. IC4 is controled by IC7 (TAM CPU).

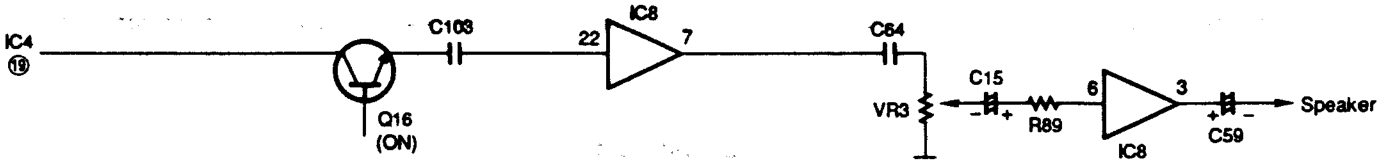
- Record mode
  The voice signal that is input from the microphone of IC8 pin 10–21→Q13→C76→IC4 pin 16.
  At IC8 the voice is analized and changed to digital data to be memorized on IC4.

Circuit Diagram


C76
MIC
R90
C67
10
21
IC8
Q13
C103
IC4
⑯

- Play mode
  IC8 synthesizes the voice signal from the data recorded on IC4, and outputs this from pin 19. The playback signal passes IC8 pin 22 (Buffer-in).

Circuit Diagram


IC4
⑲
Q16
(ON)
C103
IC8
22
7
C64
VR3
C15
R89
6
3
IC8
C59
Speaker

■ VOX CIRCUIT

Function:

The VOX circuit is designed to detect cyclic signals in which the signal is ON for 100 msec. to 1 sec., continuous sounds and no sound at all.

After detection, the CPU issues an instruction that makes VOX operation possible.

This means that when a telephone call has ended, the phone is reset and is ready to receive the next call.

Circuit Operation:

The vox signal flows as follows:

IC8 pin 22→IC8 pin 25→IC7 pin 27 (VOX).

Circuit Diagram ... **Refer to the page 27.**

■ CPC (CALLING PARTY CONTROL) DETECTOR CIRCUIT

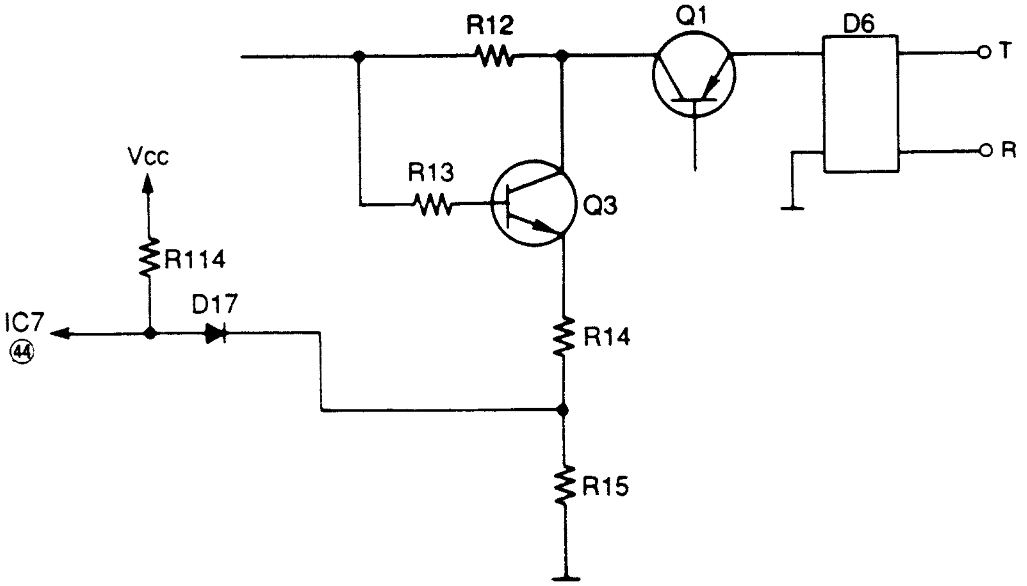
Function:

The CPC DETECTOR complements the units shut off, in the ANSWER mode, after the caller hangs up. At this time, the CPC DETECTOR takes over. The CPC DETECTOR senses the temporary disconnection of the telephone line which occurs after the caller hangs up.

Circuit Operation:

When the unit seizes a line, current will flow through D6, Q1 and R12. As a result, voltage will be applied across both ends of R12, causing current to flow to the base of Q3 via R13, causing Q3 will turn ON. Consequently, voltage will be applied across both ends of R14 and R15. As a result, IC7 pin 44 will go High through D17. If then the line is momentarily cut, line current will cease to flow, and voltage will no longer be applied across R12, thus and Q3 will turn OFF. IC7 pin 44 will go Low, hence this condition will be detected.

Circuit Diagram



■ RECORD CIRCUIT(ICM)

Circuit Operation:

(Recording Signals)

Recording an input signal from the telephone line or MIC is selected by IC8.

The recording signal flows as follows:

Mic →R168 →C67 →pin 10 of IC8 →pin 21 of IC8 →emitter of Q13 →collector of Q13 →C76 →R100 →C78 →pin 19 of IC8 →pin 18 of IC8 →C79 →ICM Head.

Telephone Line →R91 →C68 →pin 11 of IC8 →pin 21 of IC8 →emitter of Q13 →collector of Q13 → C76 → R100 → C78 → pin 19 of IC8 → pin 18 of IC8 → C79 → ICM Head.

(Signal)

The beep tone is generated by IC7.

The beep tone of the ICM recording (IC7) is processed to the ICM recording head via R123.

The alarm beep which is emitted during 2-way recording flows from pin 17 of IC7 through R109, C85, then to Q5 and the line. The resulting signal is recorded from the line.

(Erase)

When in the Rec mode, pin 36 of IC7 is High.

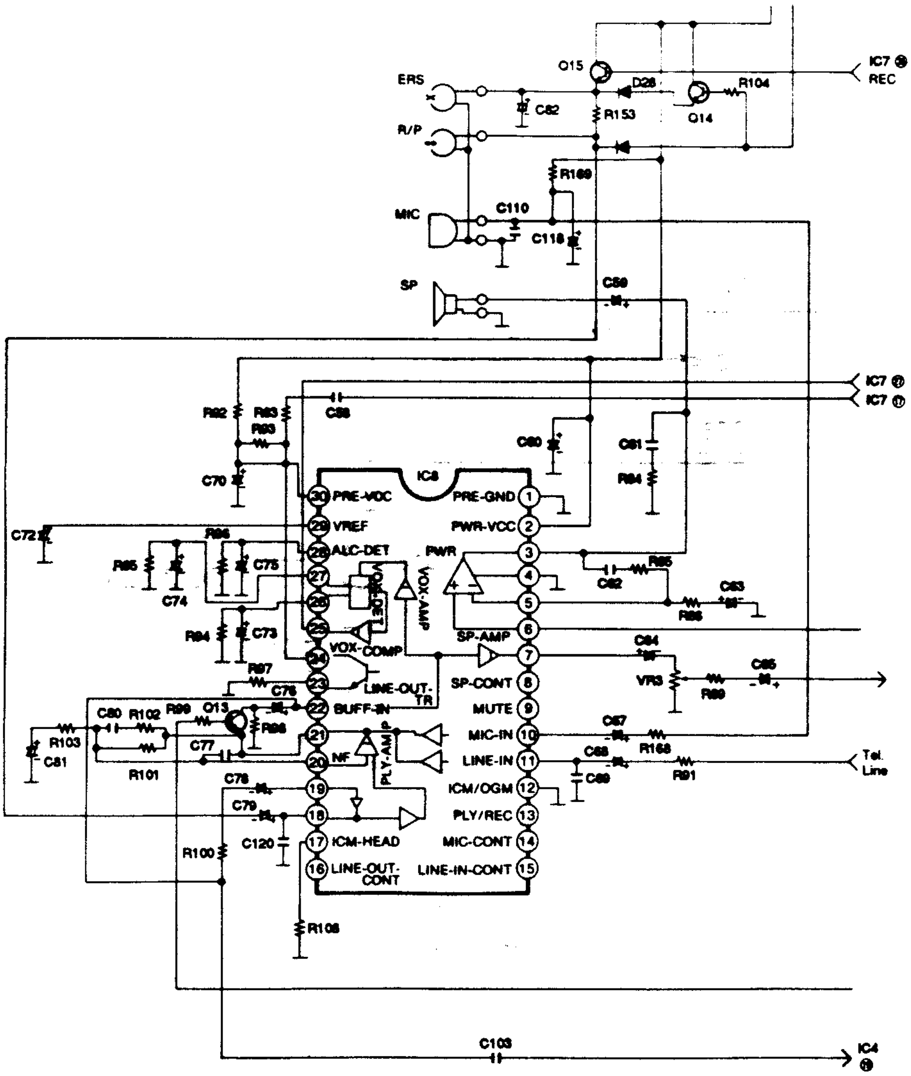
The voltage is applied to the Erase Head, thus the Erase Head is activated.

The bias current is applied to the R/P Head via Q14 and D27.

The DC current is as follows;

DC(6V) → Q27 turns ON (by High level of pin 36 of IC7) → collector of Q27 → emitter of Q27 → Erase Head.

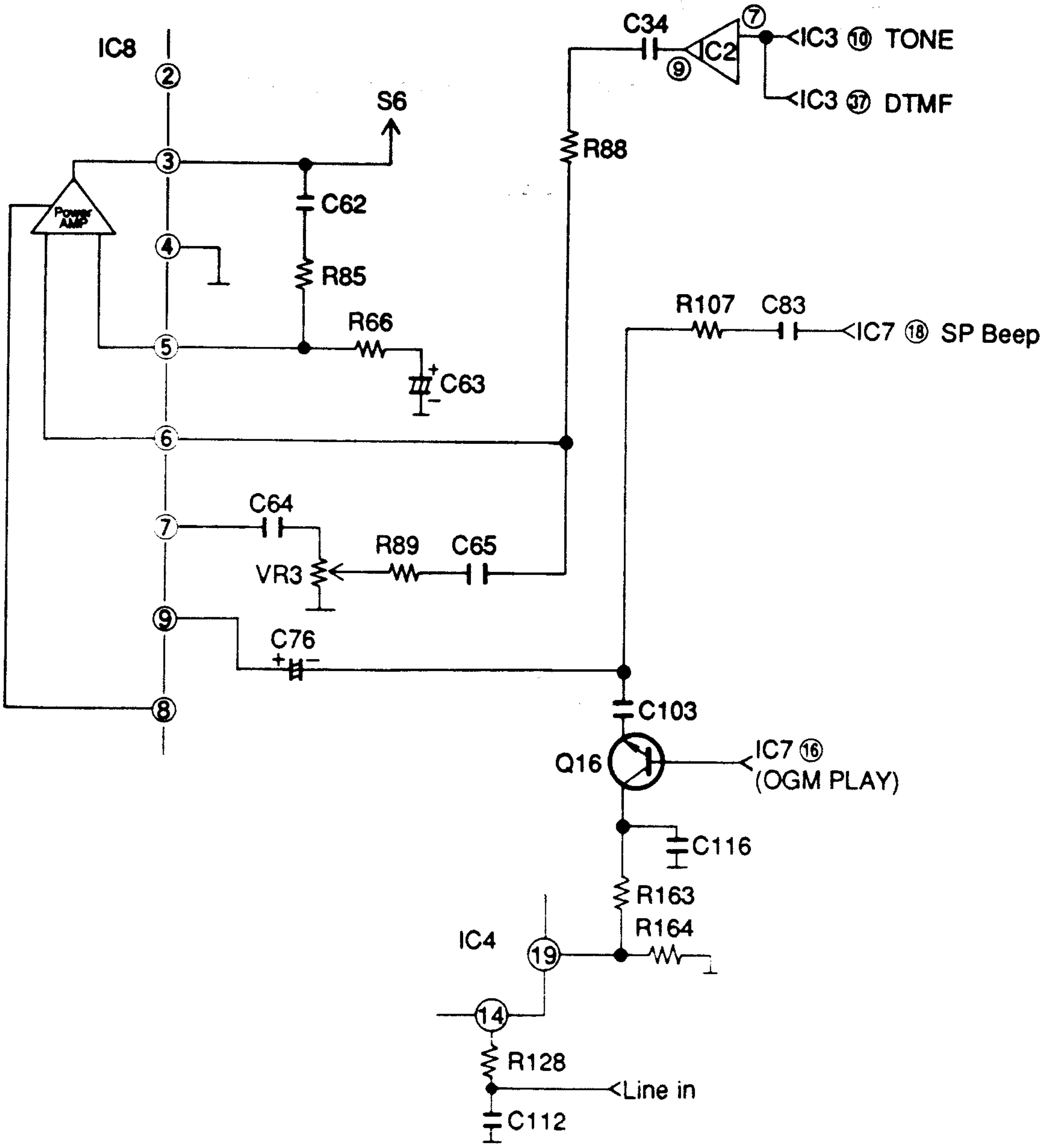
Circuit Diagram


Q15
IC7 ㊱
REC
ERS
D28
R104
C82
R153
Q14
R/P
R169
MIC
C110
C118
SP
C59
IC7 ㉗
IC7 ⑰
R92
R83
R93
C58
C60
C61
R84
C70
IC8
30 PRE-VOC
29 VREF
28 ALC-DET
27
26
25
24
23
22 BUFF-IN
21
20 NF
19
18
17 ICM-HEAD
16 LINE-OUT-CONT
PRE-GND 1
PWR-VCC 2
PWR
3
4
5
6
SP-AMP
7
SP-CONT 8
MUTE 9
MIC-IN 10
LINE-IN 11
ICM/OGM 12
PLY/REC 13
MIC-CONT 14
LINE-IN-CONT 15
VOX-DET
VOX-AMP
VOX-COMP
LINE-OUT-TR
PLY-AMP
C72
R96
R95
C75
C74
R94
C73
R97
C76
C80
R102
R99
Q13
R98
R103
C81
C77
R101
C78
C79
C120
R100
R108
C62
R85
C63
R86
C64
C65
VR3
R89
C67
R168
C68
C69
R91
Tel. Line
C103
IC4 ⑬

■ MONITOR CIRCUIT AND SPEAKER MUTE CIRCUIT

Circuit Operation:
The monitor signal flow as follows:
Pin 7 of IC8 → C64 → VR3 → C65 → R89 → IC8(pin 6~pin 3) → C59 → Speaker.
A mute circuit is also provided to eliminate speaker noise, hum, etc. The power amplifier is switched off in IC8 and Muting is accomplished except when the monitor tone is outputting.
The speaker beep tone path: pin 18 of IC7 → C83 → R107 → IC8(pin 6~pin 3) → C59 → Speaker.
The tone path:pin 10 of IC3 → IC2 (pin 7~pin 9) → C34 → R88 → IC8 (Pin 6~pin 3) → C59 → Speaker.
Monitor Reception Signal path: Line in → IC4(pin 14~pin 19) → R163 → collector of Q16 → emitter of Q16 → C103 → C76 → IC8(pin 22~pin 7) → pin 6 of IC8.
At this time, the MUTE is cleared, and sound is heard from the speaker.
DTMF, Audible tone path:pin 37 of IC3 → IC2 (pin 7~pin 9) → C34 → R88 → IC8 (Pin 6~pin 3) → C59 → Speaker.

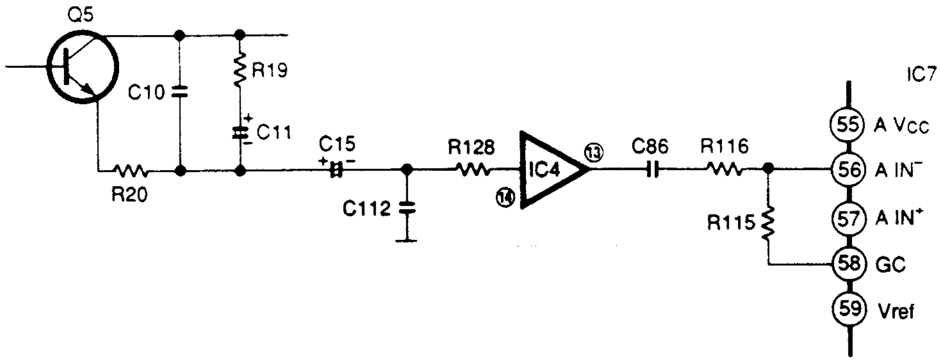
Circuit Diagram


IC8
②
③
④
⑤
⑥
⑦
⑨
⑧
Power AMP
S6
C62
R85
R66
C63
C64
VR3
R89
C65
C76
C34
IC2
⑦
⑨
IC3 ⑩ TONE
IC3 ㊲ DTMF
R88
R107
C83
IC7 ⑱ SP Beep
C103
Q16
IC7 ⑯
(OGM PLAY)
C116
R163
R164
IC4
19
14
R128
Line in
C112

■ REMOTE SIGNAL DETECTOR CIRCUIT

A remote control signal is used with the dial-tone multiple- frequency (DTMF) signal.
The remote signal output from the telephone line via Q5 and C15. And it is inputted to pin 56 of IC7 passed through the amplifier (IC4, R128 and C112). The DTMF signal is inputted to pin 56 of IC7.

Circuit Diagram

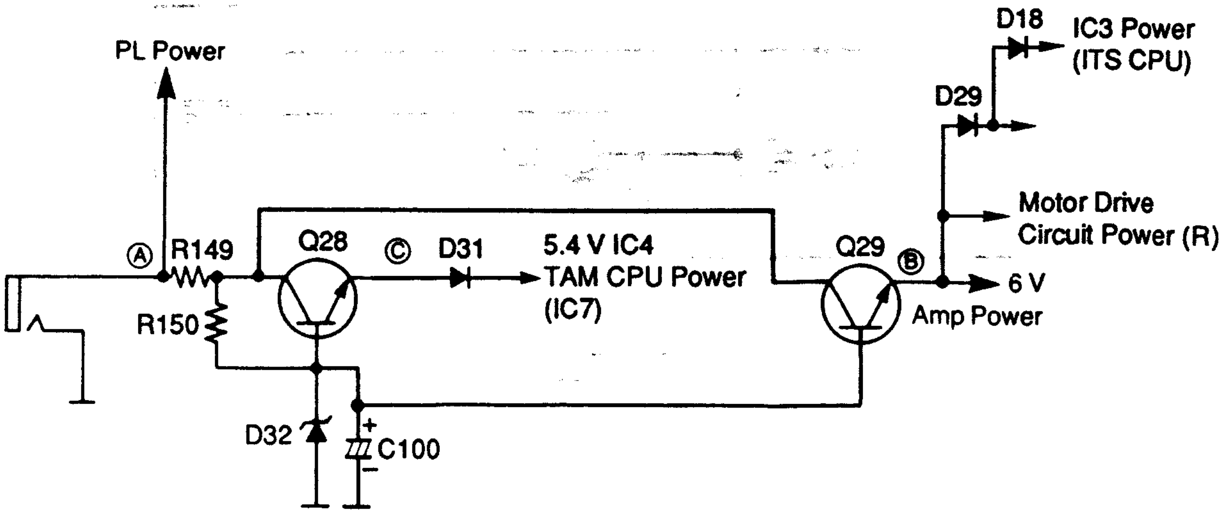

Q5
C10
R19
C11
R20
C15
C112
R128
IC4
⑬
⑭
C86
R116
R115
IC7
(55) A Vcc
(56) A IN⁻
(57) A IN⁺
(58) GC
(59) Vref

■ POWER SUPPLY CIRCUIT

Function
Power from the AC adaptor passes through a 2-stage regulating block consisting of Q28 and Q29 and provides system voltages of 6V.

Circuit Operation:
Power from the AC adaptor is supplied directly to the plunger (A). Q29 is the regulated power supply. The voltage at point Ⓑ is regulated to 6 V by the 6.8 V zener voltage of D32→Amp power. Q28 is the regulated power supply. The voltage at point Ⓒ is regulated to 6 V by the zener voltage of D32. The 6 V voltage is shifted by D31 to 5.4.

Circuit Diagram

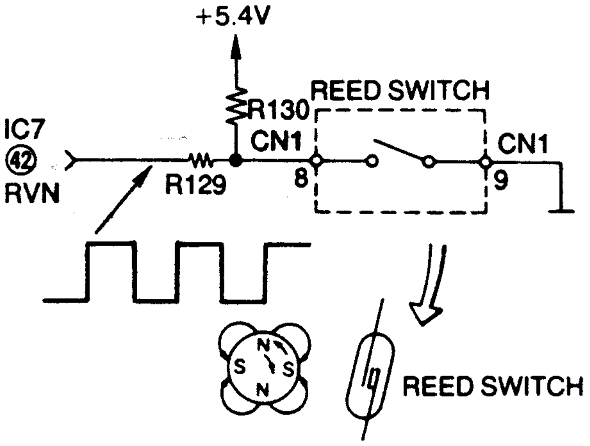

PL Power
Ⓐ
R149
R150
Q28
Ⓒ
D31
5.4 V IC4
TAM CPU Power
(IC7)
D32
C100
Q29
Ⓑ
D18
IC3 Power
(ITS CPU)
D29
Motor Drive
Circuit Power (R)
6 V
Amp Power

■ICM TAPE ROTATION DETECTOR CIRCUIT

Circuit Operation:
The changes in the direction of the magnetic field caused by the rotation of the four-pole ferrite magnet are detected by the Reed Switch; this output is added to the microcomputer input.

Reed Switch→R129→IC7 pin 42

Circuit Diagram

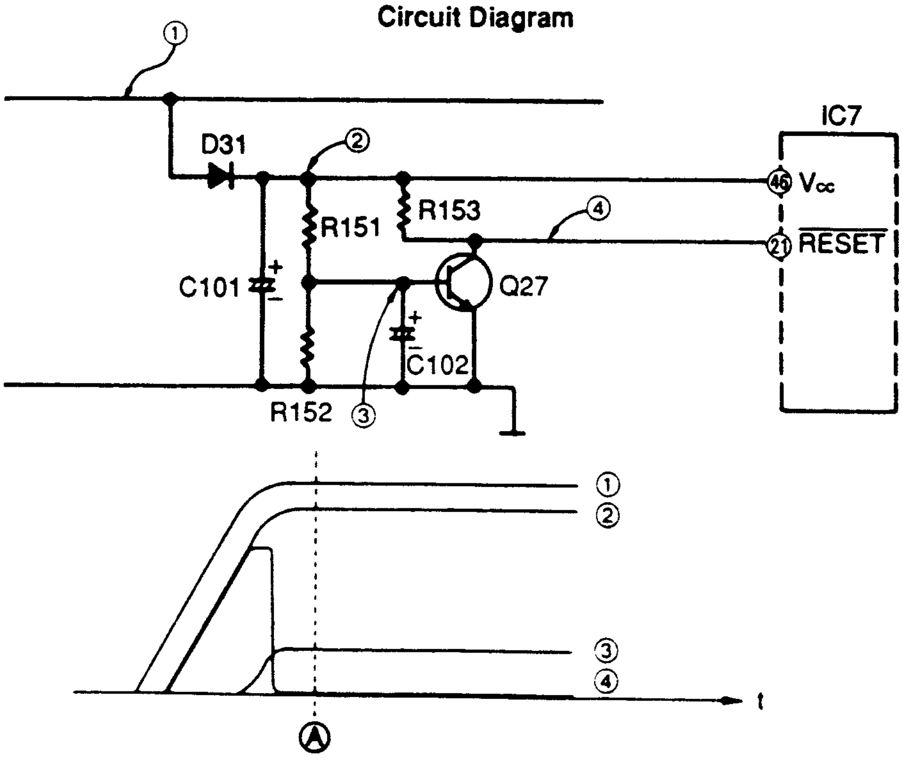

+5.4V
R130
REED SWITCH
IC7
㊷
RVN
R129
CN1
8
CN1
9
N
S
S
N
REED SWITCH

■ INITIALIZE CIRCUIT

Function:
This circuit is used for initializing the microcomputer when the AC adaptor is applied.

Circuit Operation:
When the unit is switched ON. Then the voltage is shifted by D31 and power is supplied to the CPU.
The voltage needed to reset the CPU is supplied from the collector of Q27.
When Q27 becomes ON and the reset terminal voltage drops the CPU has been reset, and the set can operate beyond point A in the circuit voltage diagram.

Circuit Diagram


①
D31
②
R151
R153
④
IC7
㊻ Vcc
㉑ RESET
C101
Q27
C102
R152
③
①
②
③
④
t
Ⓐ

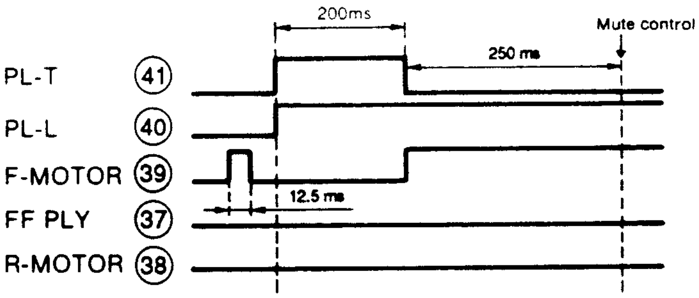
■ TAPE TRANSPORT CONTROL

Circuit Operation:

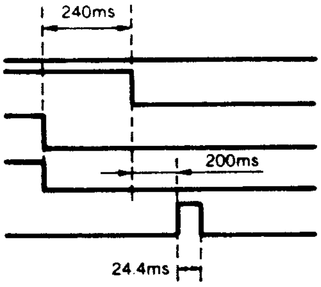
The timing for the plunger and motor which are used to operate the deck is as shown in the timing chart.

Timing Chart

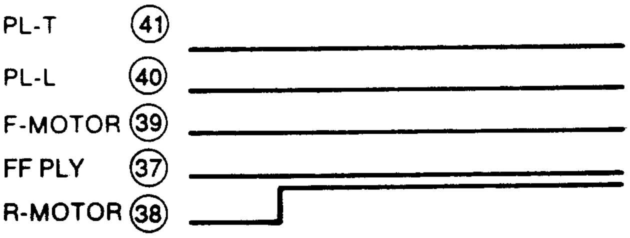
• PLAY/REC



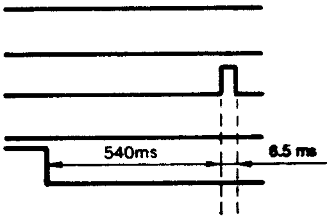
• STOP



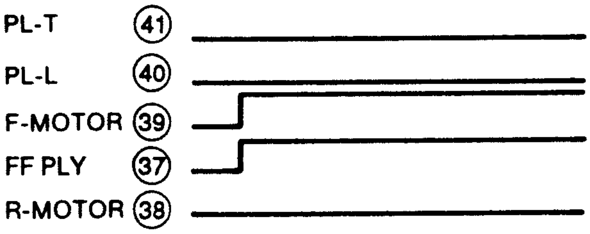
• REW



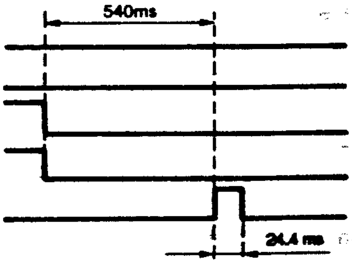
• STOP



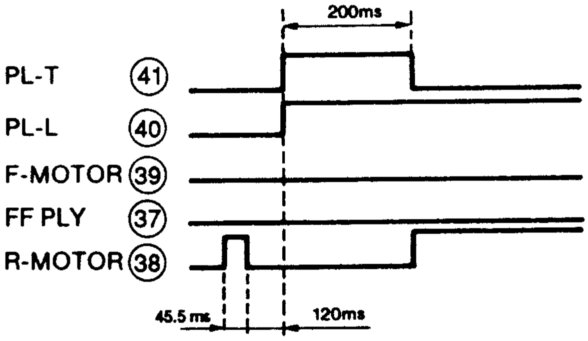
• FF



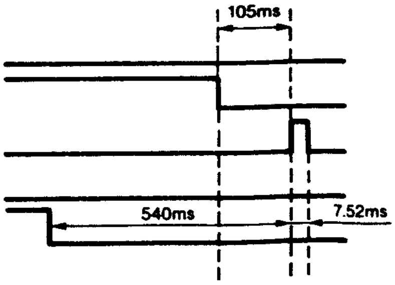
• STOP



• ERASE



• STOP



■ SPEAKERPHONE CIRCUIT

Function:
This circuit controls the automatic switching of the transmitted and received signals, to and from the telephone line, when the unit is used in the hands-free mode.

Circuit Operation:
The Speakerphone can only provide a one-way communication path.
In other words, it can either transmit an outgoing signal or receive an incoming signal at a given time, but cannot do both simultaneously. Therefore, a switching circuit is necessary to control the flow of the outgoing and incoming signals. This switching circuit is contained in IC2 and consists of a Voice Detector, Tx Attenuator, Rx Attenuator, Comparator and Attenuator Control. The circuit analyzes whether the Tx (transmit) or the Rx (receive) signal is louder, and then it processes the signals such that the louder signal is given precedence.
The Voice Detector provides a DC input to the Attenuator Control corresponding to the Tx signal.
The Comparator receives a Tx and a Rx signal, and supplies a DC input to the Attenuator Control corresponding to the Rx signal. The Attenuator Control provides a control signal to the Tx and the Rx Attenuator to switch the appropriate signals on and off. The Attenuator Control also detects the level of the volume control to automatically adjust for changing ambient conditions.

1) Transmission Signal Path
The input signal from the microphone is sent through the circuit via the following path:
- Mic→ Pin 15 of IC2 → Pin 27 of IC2 → Interface (Q5) → Telephone Line.

2) Reception Signal Path
Signals received from the telephone line are outputted at the speaker via the following path:
- Telephone Line → Interface (Q5)→Pin 23 of IC2→Pin 1 of IC2→Pin 7 of IC2→Pin 9 of IC2→Speaker.

3) Control Signal Path
Control signals for transmission and reception are inputted to IC2 via the following path:
(Transmission Control Signal Path)
- Mic → Pin 15 of IC2 → Pin 2 of IC2 → Pin 4 of IC2.

(Reception Control Signal Path)
- Telephone Line→ Interface (Q5)→Pin 23 of IC2→Pin 7 of IC2→Pin 9 of IC2→Pin 6 of IC2.

4) Transmission/Reception Switching
The comparison result between Rx and Rx outputs as a DC level of IC2 pin 25.

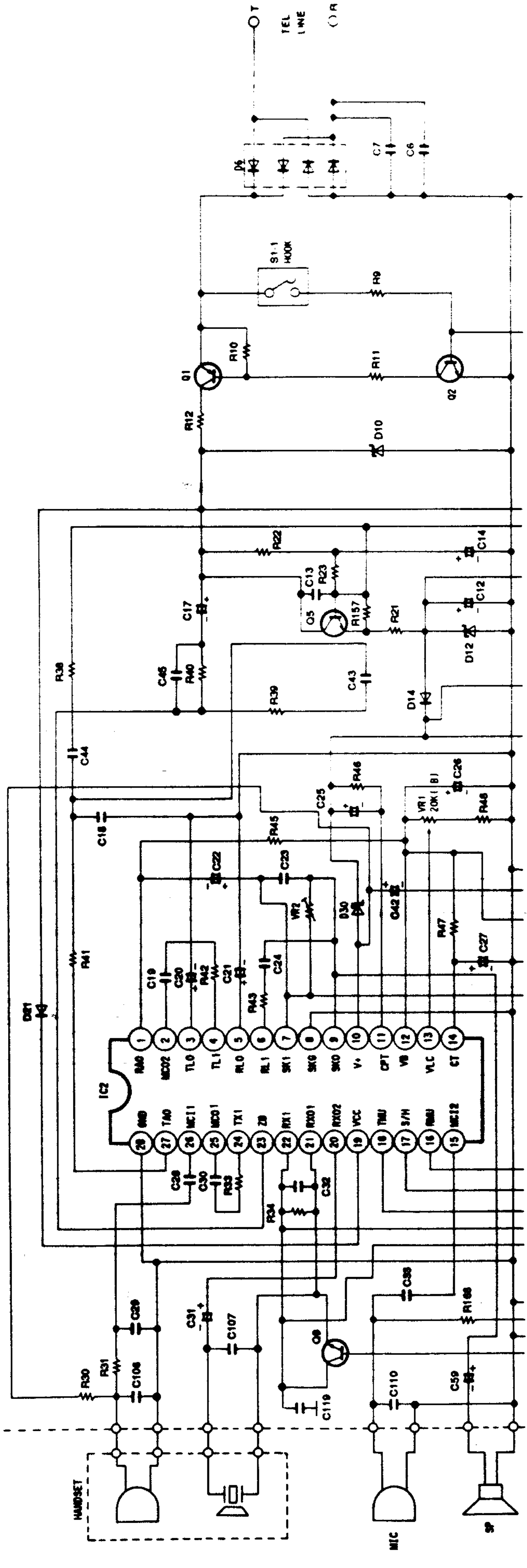
Tx level is high .... Pin 25 = Pin 20—6 mV
Rx level is high .... Pin 25 = Pin 20—150 mV

Comparator output is connected to the attenuator control inside of IC2.

5) Voice Detector
The output of the mic amp (Pin 10 of IC2) is supplied to Pin 13 of IC2 as a control signal for the voice detector.

6) Attenuator Control
The attenuator control detects the setting of the volume control through Pin 24 of IC2 to automatically adjust for changing ambient conditions.

Circuit Diagram


T
TEL LINE
R
D6
C7
C6
S1-1 HOOK
R9
R10
Q1
R11
Q2
R12
D10
R22
C14
C13
R23
C17
C12
Q5
R157
R21
D12
R38
C45
R40
C43
R39
D14
C44
R46
C26
C25
VR1 20K(B)
R48
C18
R45
C22
C23
VR2
D30
C42
R47
C27
R41
C19
C20
R42
C21
C24
R43
D21
IC2
RA0
MCO2
TLO
TL1
RLO
RL1
SK1
SKG
SKO
V+
CPT
VB
VLC
CT
GND
TAO
MCI1
MCO1
TX1
ZB
RX1
RXO1
RXO2
VCC
TMU
S/H
RMU
MCI2
C28
C30
R33
C32
R34
C38
R168
C31
C107
Q6
R30
R31
C106
C29
C119
C110
C59
HANDSET
MIC
SP

■ DISPLAY CIRCUIT

Circuit Operation:

IC301 drives the LCD and communicates data via the ports of IC7 pin 5, 6, 7 and 8, which also detects the LCD indication and announce key input.

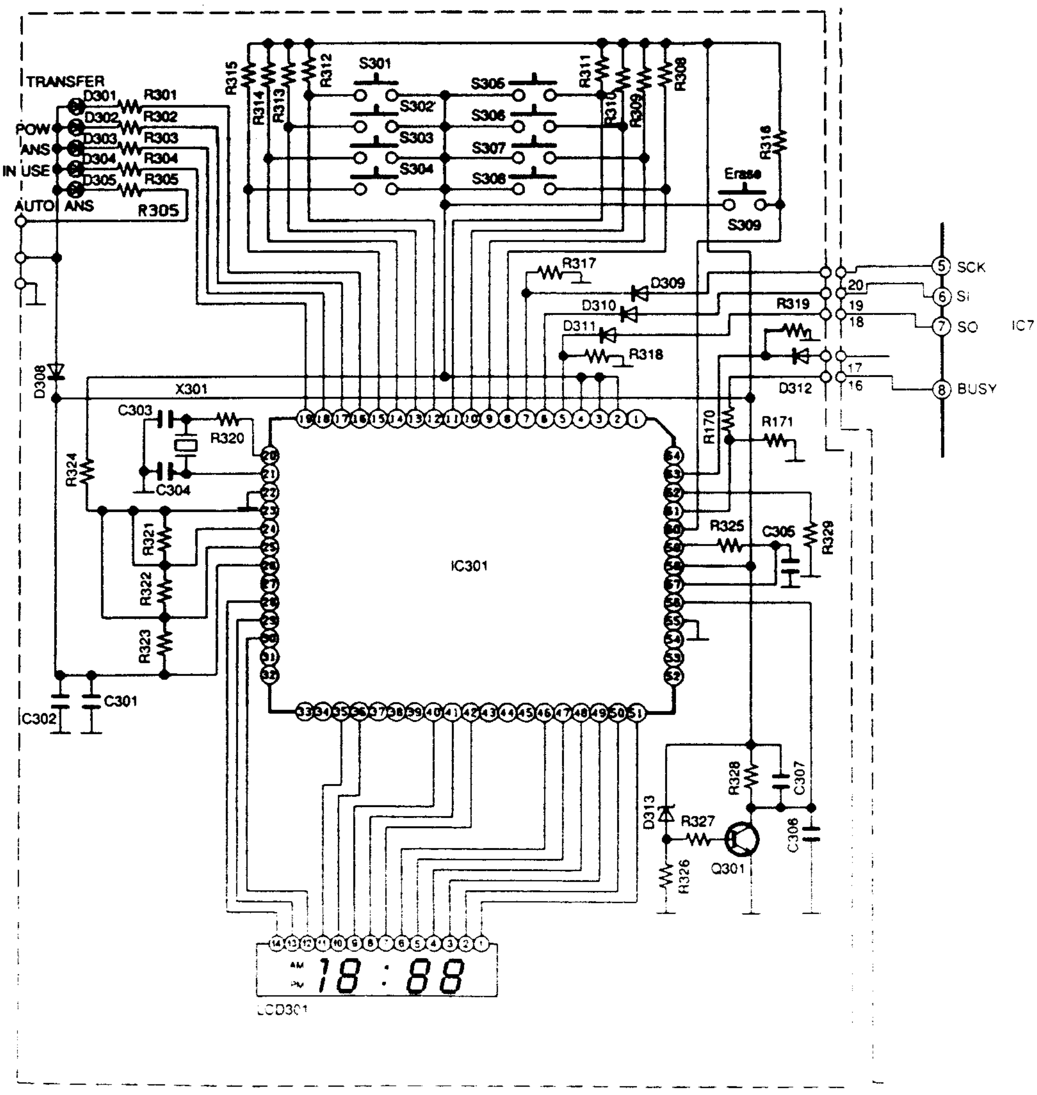
When the voltage for the LCD indication will be produced through R323, R322, R321 and R324.

$$Vdd=Vdd,\ VLC1=\frac{(Vdd-VLC3)2}{3},\ VLC2=\frac{1}{3}\ (Vdd-VLC3)$$

Vdd -VLC3=5V the voltage of 5V will be provided to the LCD.

There are system oscillation consisting of R325,C305 and clock oscillation consisting of X301,C303 and C304 in the IC301. Although both oscillators usually work when the LCD Power is H, during the power failure LCD power port 61 goes L and it goes to the standby mode, and then clock oscillation only works. At that time, IC301 is backed up at C301. When Vdd goes under 3V, Q301 becomes off and the unit will be reset.

Circuit Diagram



TRANSFER
POW
ANS
IN USE
AUTO ANS
D301
D302
D303
D304
D305
R301
R302
R303
R304
R305
R305
R315
R314
R313
R312
S301
S302
S303
S304
S305
S306
S307
S308
R311
R310
R309
R308
R316
Erase
S309
R317
D309
D310
D311
R318
R319
D312
D308
X301
C303
R320
C304
R324
R321
R322
R323
C301
C302
IC301
R170
R171
R325
C305
R329
R328
C307
C306
D313
R327
R326
Q301
20
19
18
17
16
⑤ SCK
⑥ SI
⑦ SO
⑧ BUSY
IC7
LCD301
AM
PM
18 : 88

TROUBLE SHOOTING GUIDE

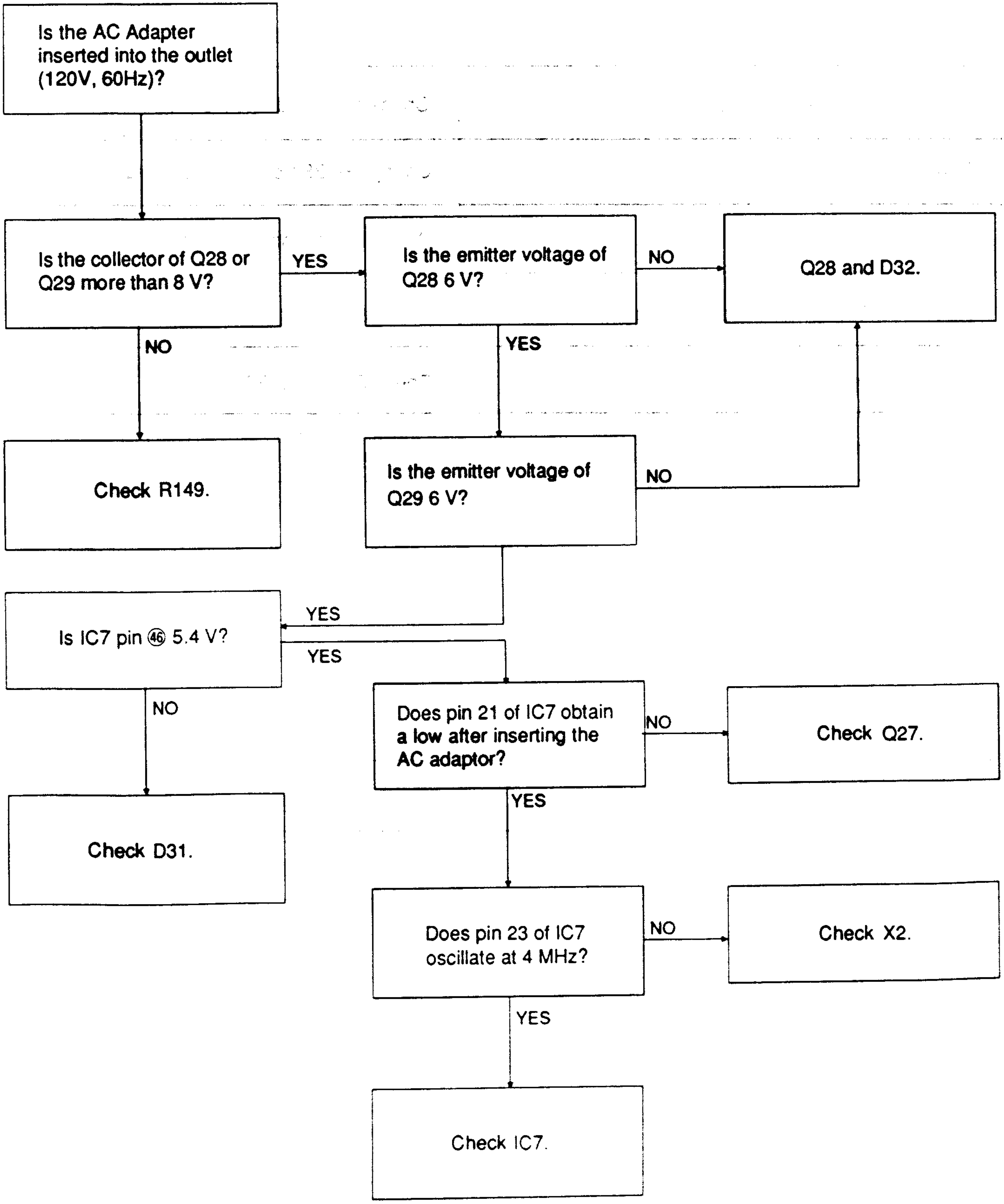
■ SERVICE HINTS

SYMPTOM	CURE
Does not ring.	Replace IC1 and Ringer SW.
Answering Machine Answers itself.	Check pin 3 and 4 of PC1 for short.
ICM will not cut off.	Change R128 from 10kΩ to 15kΩ.
OGM recording distorted.	Check for cold solder joints on IC4.
No PWR/ AFTER PWR fixed no plunger a activation.	Check R148, R149, Q26, D33 and D34.
Intermittent rewind.	Check S302 and R313.
Goes into hold after taking ICM.	Check R162, pin 27 of IC7, R115, R116 and C26.
Keypad inop.	Check solder connections on CN2, CN301 and IC301.
OGM won't store memory.	Check Q13 and Q16.
Can dial out but incoming calls get busy signal.	Check Q1 , Q2, D6 and SA1.
Holds line constantly.	Check Q1 and Q2.
Would not record all OGM.	Check C67, R90 and C110.
Would not Handset Muted.	Check R54, R37, Q8 and D20.
Would not MIC Muted.	Check R55.
Would not Tone Dial.	Check R56, C36 and C37.

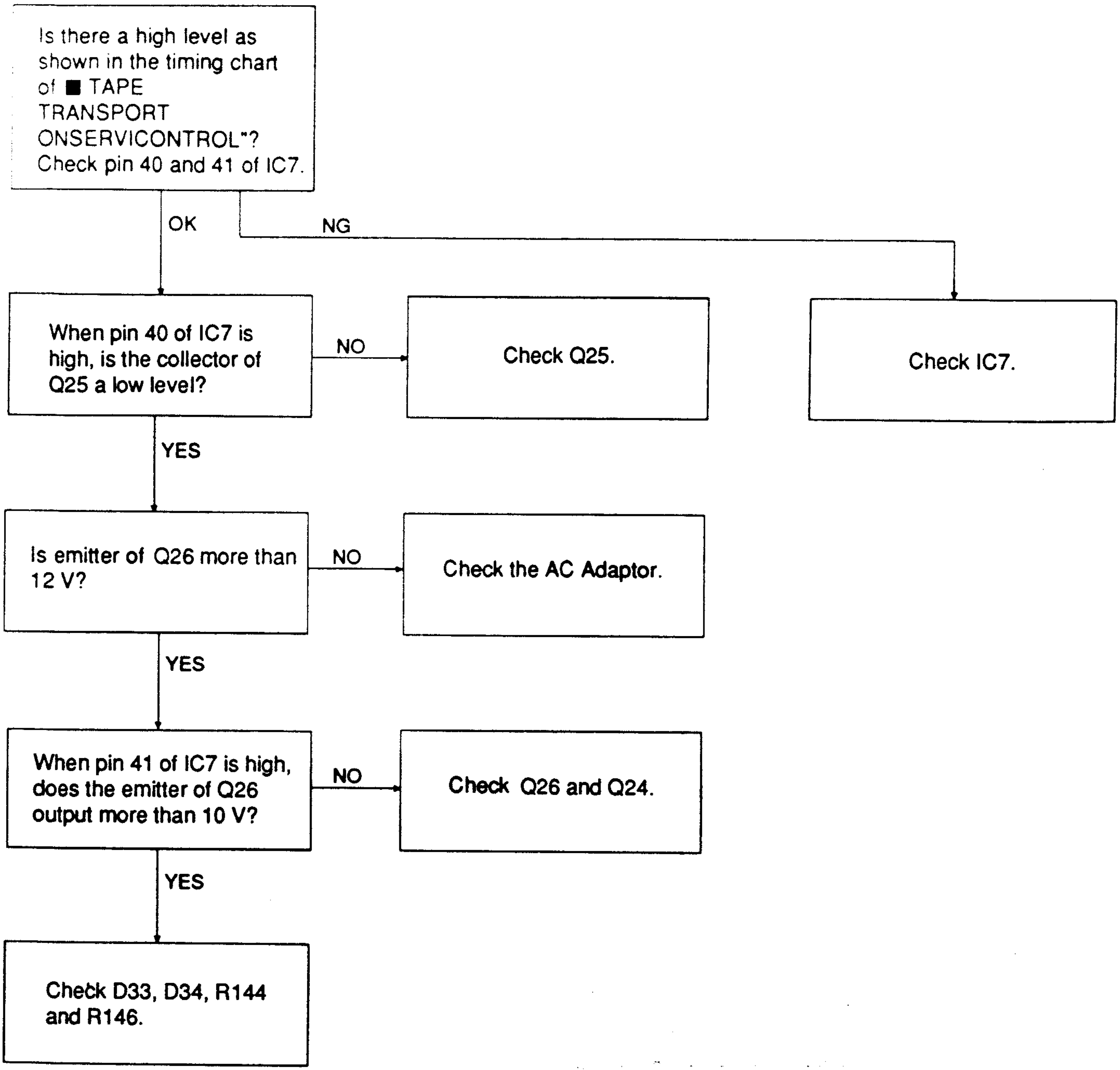
TROUBLESHOOTING GUIDE

(TAM)

1) NO FUNCTIONS OPERATE.

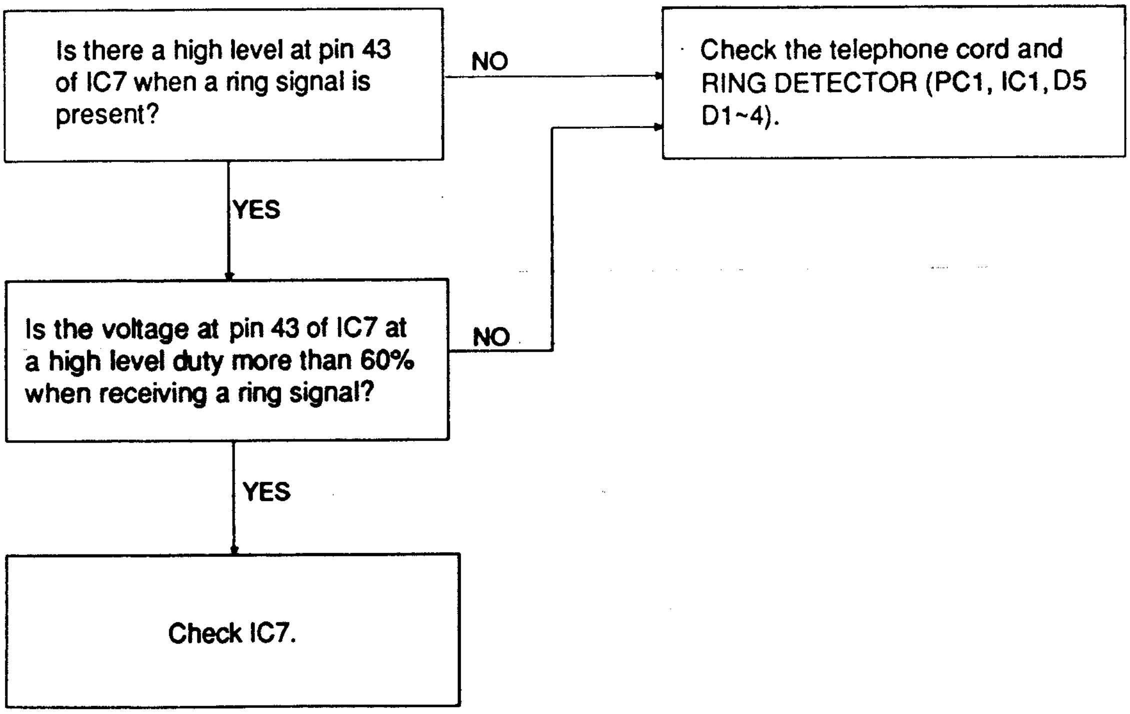

Is the AC Adapter inserted into the outlet (120V, 60Hz)?
Is the collector of Q28 or Q29 more than 8 V?
YES
Is the emitter voltage of Q28 6 V?
NO
Q28 and D32.
NO
YES
Check R149.
Is the emitter voltage of Q29 6 V?
NO
YES
Is IC7 pin ㊻ 5.4 V?
YES
NO
Does pin 21 of IC7 obtain a low after inserting the AC adaptor?
NO
Check Q27.
YES
Check D31.
Does pin 23 of IC7 oscillate at 4 MHz?
NO
Check X2.
YES
Check IC7.

2) THE PULL OF PLUNGER IS POOR OR NOT AT ALL.


Is there a high level as shown in the timing chart of ■ TAPE TRANSPORT ONSERVICONTROL"? Check pin 40 and 41 of IC7.
OK
NG
When pin 40 of IC7 is high, is the collector of Q25 a low level?
NO
Check Q25.
Check IC7.
YES
Is emitter of Q26 more than 12 V?
NO
Check the AC Adaptor.
YES
When pin 41 of IC7 is high, does the emitter of Q26 output more than 10 V?
NO
Check Q26 and Q24.
YES
Check D33, D34, R144 and R146.

3) FAST ERASE DOES NOT WORK.
Check Q14 and D27.

4) DOES NOT ANSWER TELEPHONE CALL


Is there a high level at pin 43 of IC7 when a ring signal is present?
NO
Check the telephone cord and RING DETECTOR (PC1, IC1, D5 D1~4).
YES
Is the voltage at pin 43 of IC7 at a high level duty more than 60% when receiving a ring signal?
NO
YES
Check IC7.

5) • ICM CONTINUES TO RECORD AFTER THE CALLER HANGS UP.
   • END OF MESSAGE CLIPPED WHEN CALLER HANGS UP.

When caller hangs up, the KX-T2634 can detect the following 4 signal type.

A. CPC pulse.
B. Dial tone or other continuous tones.
C. Silence.
D. Cyclic signals.

A. Check CPC DETECTOR CIRCUIT (Q3, R12, R13, R14, R15, R114, D17, IC7 pin 44.))
B., C., D.
Check VOX DETECTOR (IC7 pin 27).

6) REMOTE CONTROLLER DOES NOT WORK/RESPONSE IS POOR.
The following are considered for the causes of no remote reception:

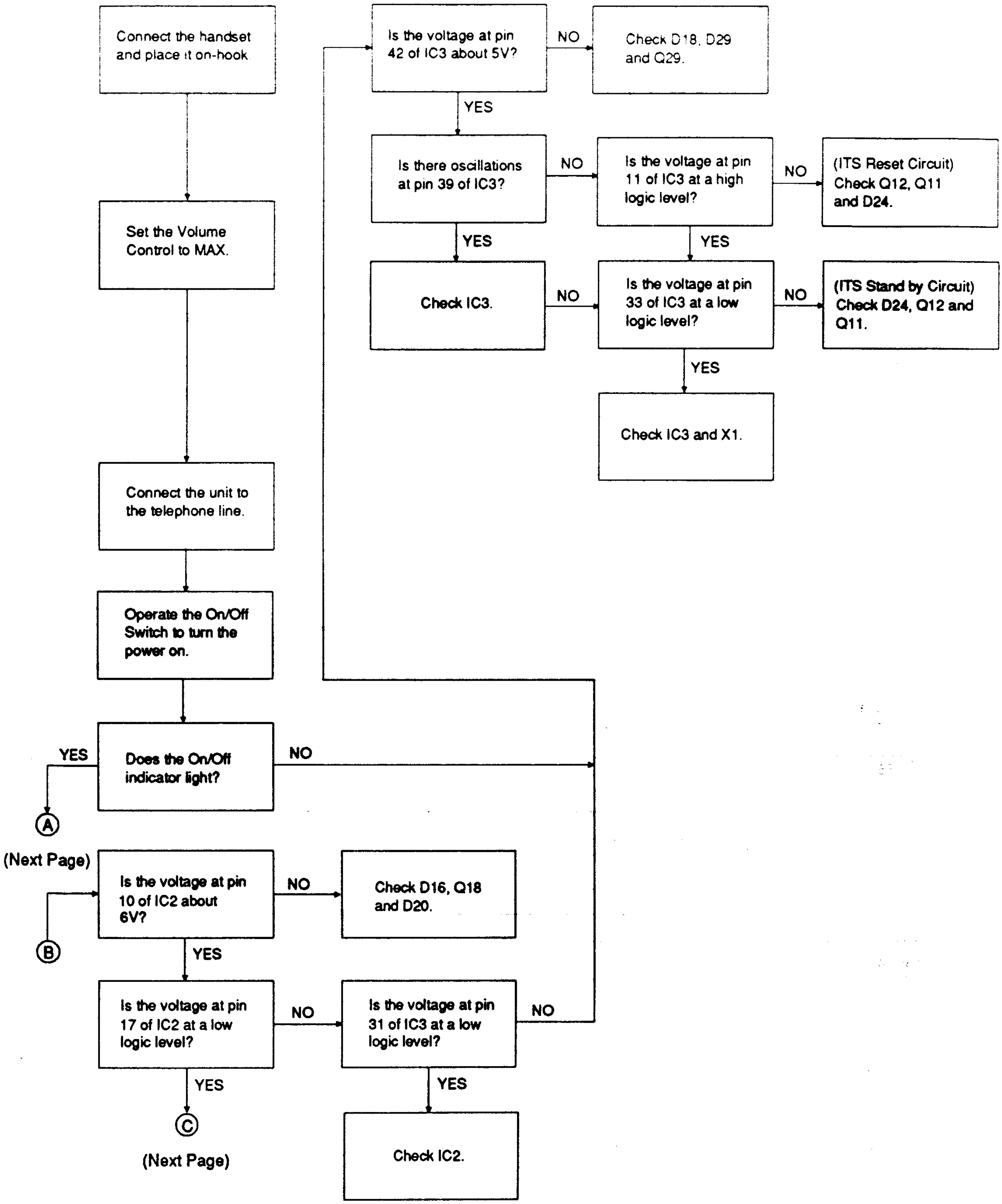
A. Is the security code the same as set on the unit.
B. High distortion in LINE OUTPUT CIRCUIT causing interference between the transmitting signal and the remote signal.
C. Excessive loss in telephone line.

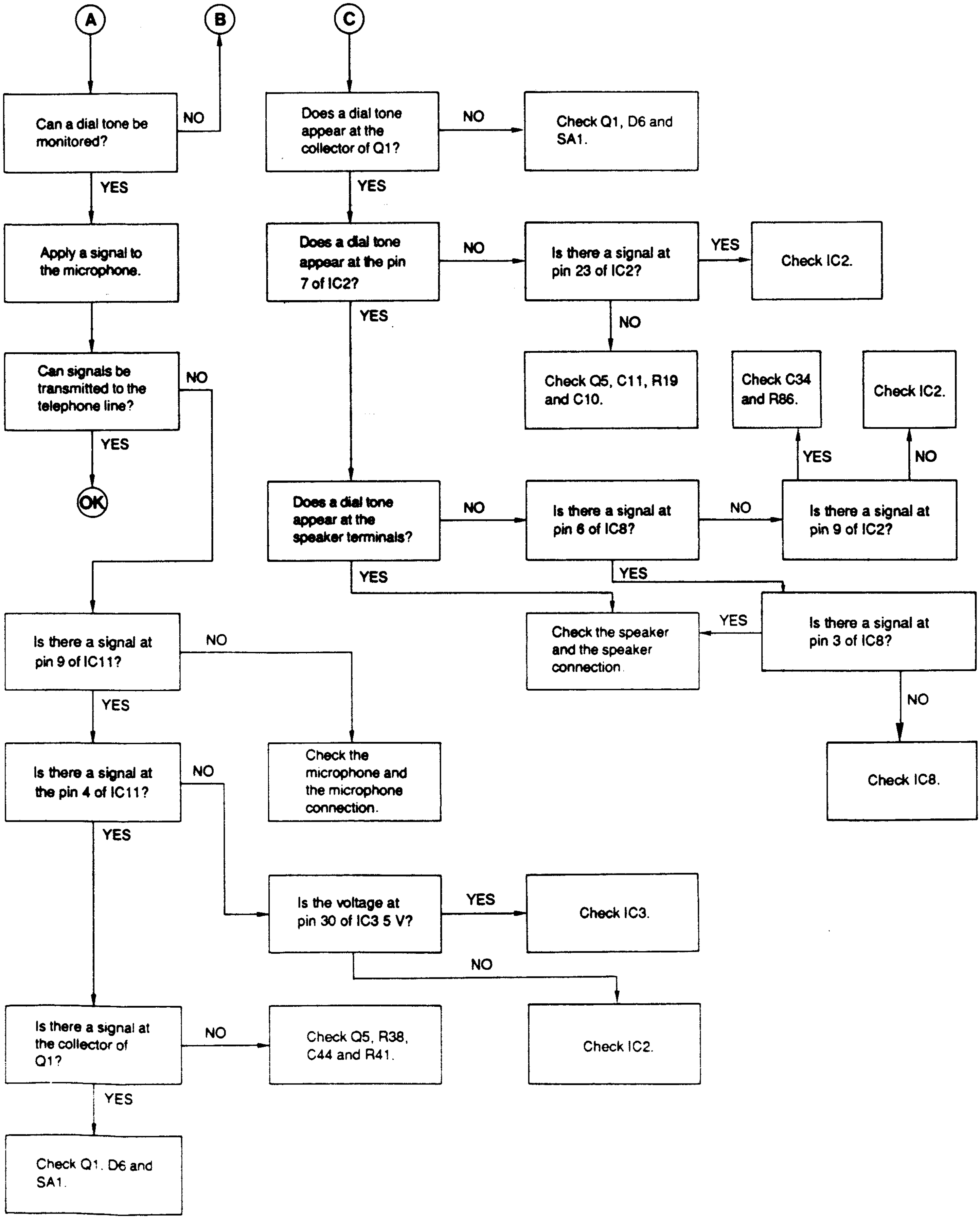
A. Check the security code of the unit.
B. Check LINE OUTPUT CIRCUIT (Q5).
C. Test on telephone line known to be working properly.

* If all of the above check N.G., check the remote controller detect circuit (IC8).

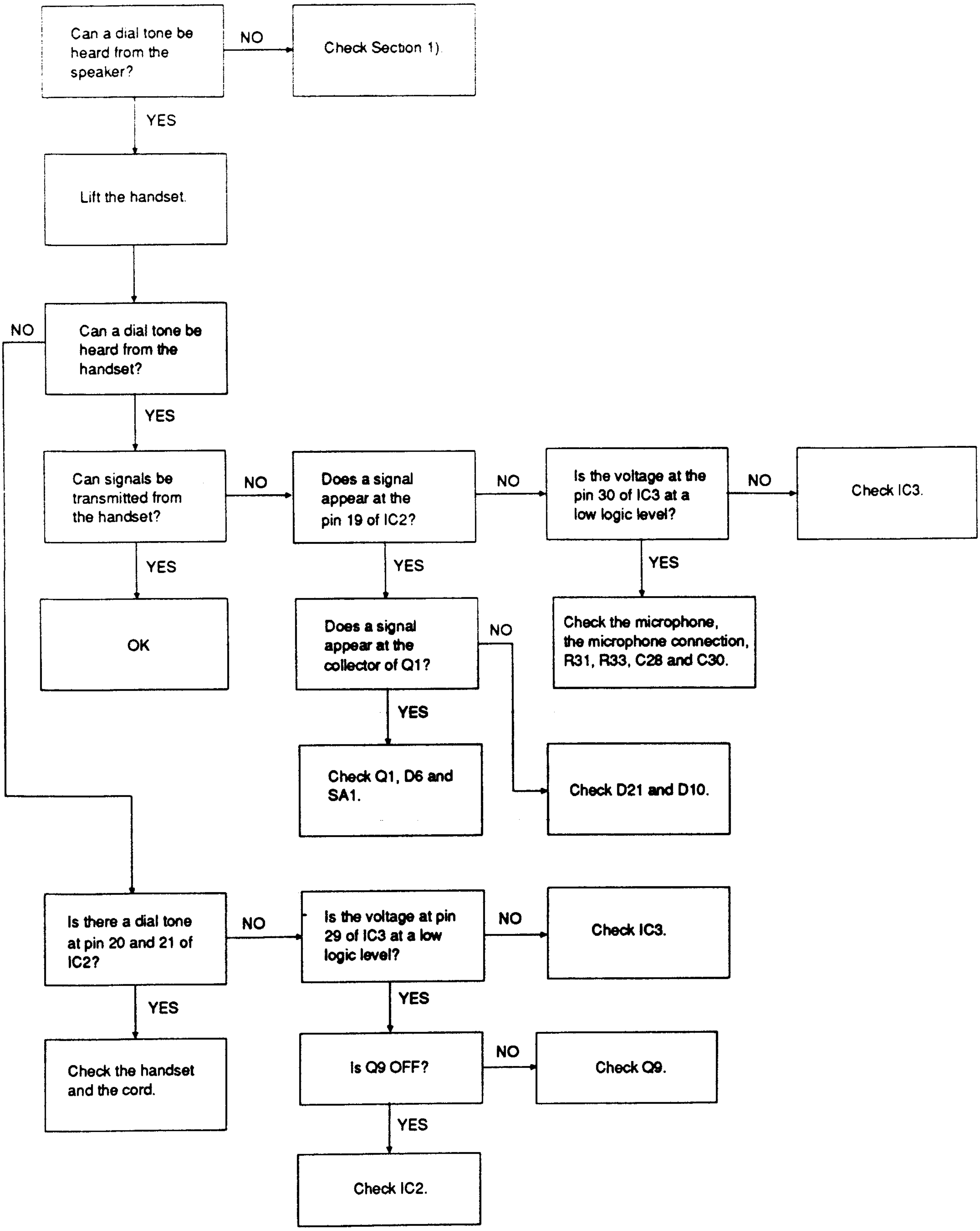
(ITS)

1. UNIT DOES NOT TURN ON

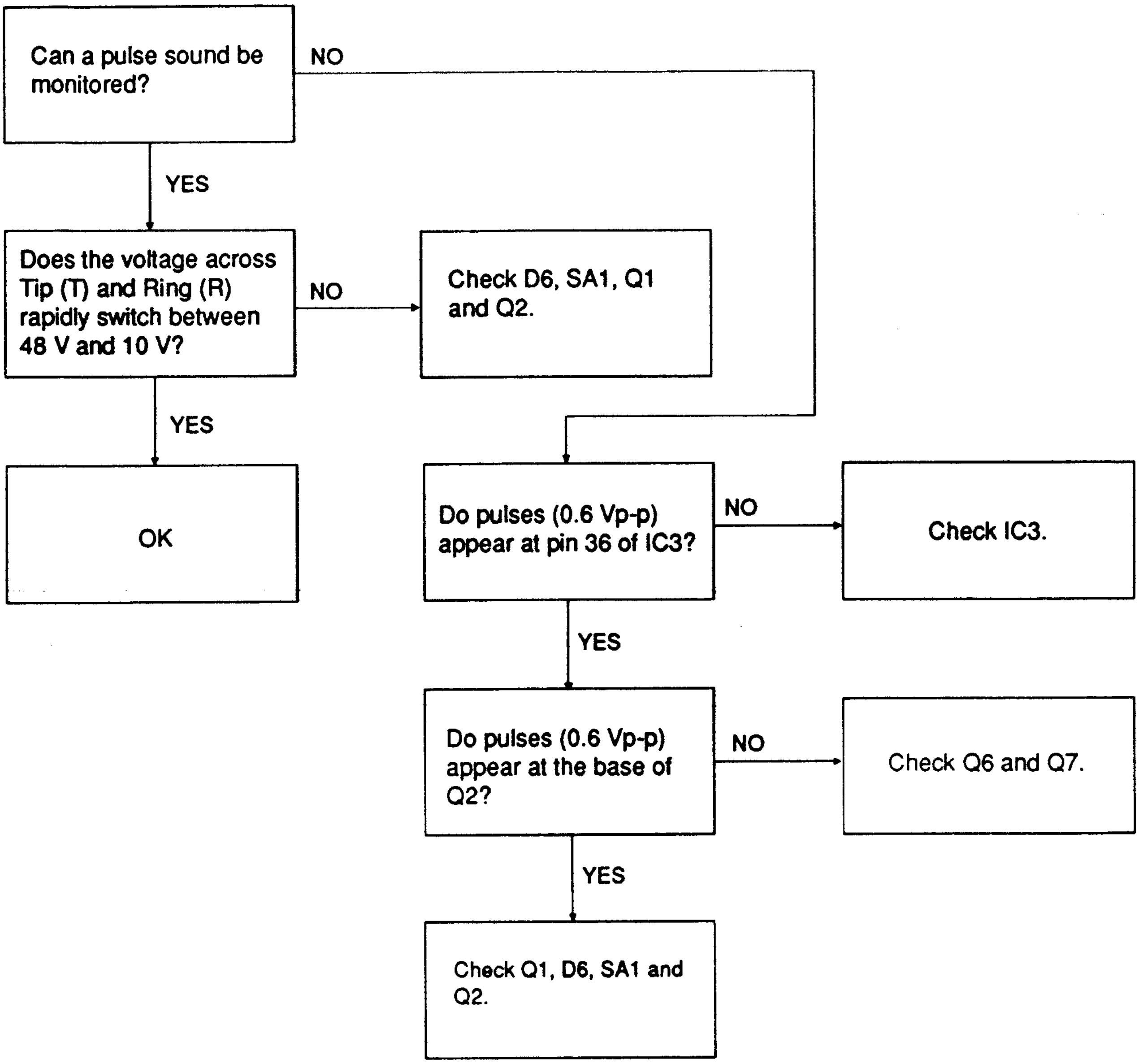

Connect the handset and place it on-hook.
Set the Volume Control to MAX.
Connect the unit to the telephone line.
Operate the On/Off Switch to turn the power on.
Does the On/Off indicator light?
YES
NO
A
(Next Page)
B
Is the voltage at pin 10 of IC2 about 6V?
NO
Check D16, Q18 and D20.
YES
Is the voltage at pin 17 of IC2 at a low logic level?
NO
YES
C
(Next Page)
Is the voltage at pin 31 of IC3 at a low logic level?
NO
YES
Check IC2.
Is the voltage at pin 42 of IC3 about 5V?
NO
Check D18, D29 and Q29.
YES
Is there oscillations at pin 39 of IC3?
NO
YES
Check IC3.
NO
Is the voltage at pin 11 of IC3 at a high logic level?
NO
(ITS Reset Circuit) Check Q12, Q11 and D24.
YES
Is the voltage at pin 33 of IC3 at a low logic level?
NO
(ITS Stand by Circuit) Check D24, Q12 and Q11.
YES
Check IC3 and X1.


A
B
C
Can a dial tone be monitored?
NO
YES
Apply a signal to the microphone.
Can signals be transmitted to the telephone line?
NO
YES
OK
Does a dial tone appear at the collector of Q1?
NO
Check Q1, D6 and SA1.
YES
Does a dial tone appear at the pin 7 of IC2?
NO
Is there a signal at pin 23 of IC2?
YES
Check IC2.
NO
Check Q5, C11, R19 and C10.
YES
Check C34 and R86.
Check IC2.
YES
NO
Does a dial tone appear at the speaker terminals?
NO
Is there a signal at pin 6 of IC8?
NO
Is there a signal at pin 9 of IC2?
YES
YES
Check the speaker and the speaker connection.
YES
Is there a signal at pin 3 of IC8?
NO
Check IC8.
Is there a signal at pin 9 of IC11?
NO
Check the microphone and the microphone connection.
YES
Is there a signal at the pin 4 of IC11?
NO
YES
Is the voltage at pin 30 of IC3 5 V?
YES
Check IC3.
NO
Check IC2.
Is there a signal at the collector of Q1?
NO
Check Q5, R38, C44 and R41.
YES
Check Q1, D6 and SA1.

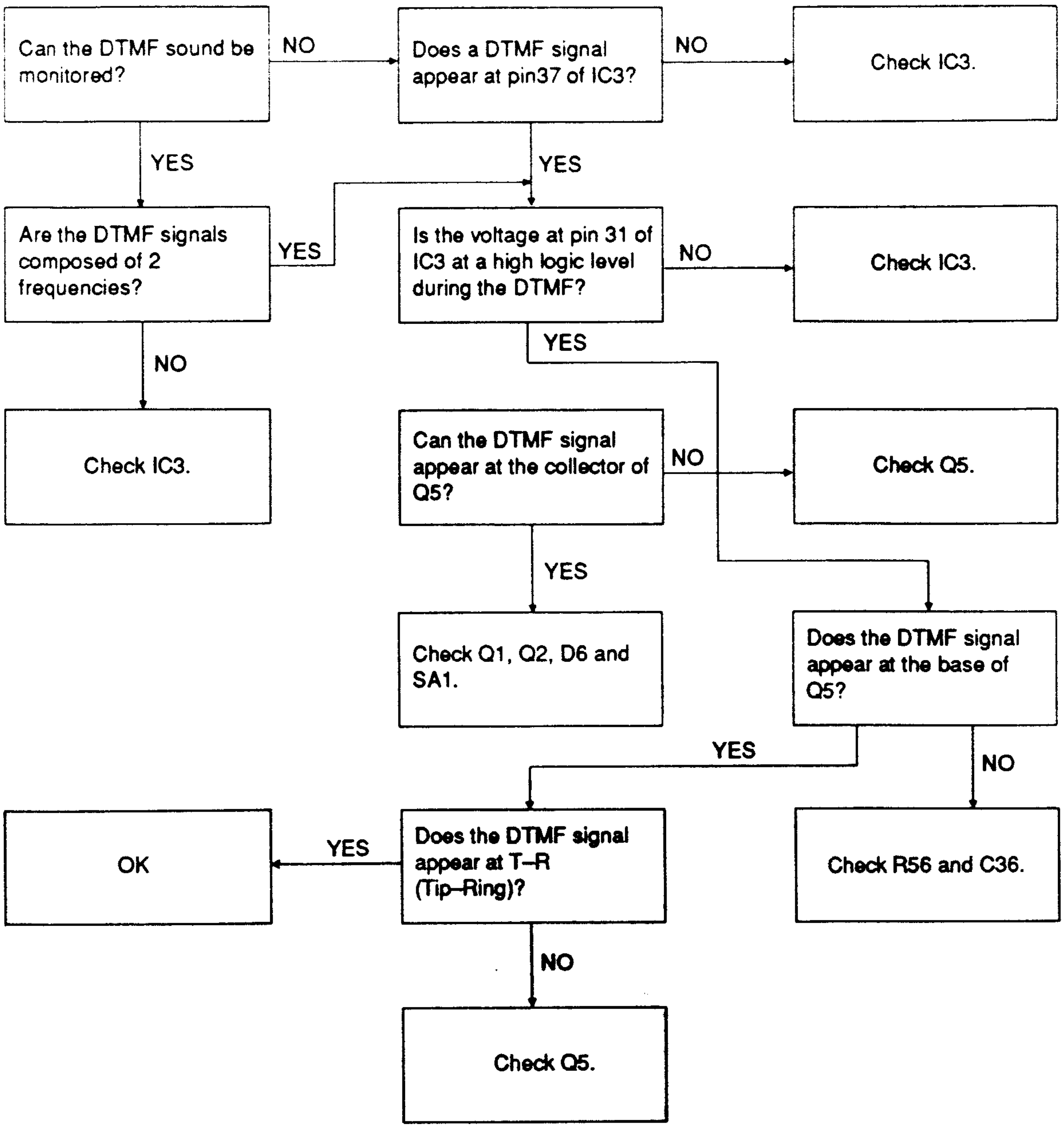
2) PROBLEMS WITH THE HANDSET


Can a dial tone be heard from the speaker?
NO
Check Section 1).
YES
Lift the handset.
NO
Can a dial tone be heard from the handset?
YES
Can signals be transmitted from the handset?
NO
Does a signal appear at the pin 19 of IC2?
NO
Is the voltage at the pin 30 of IC3 at a low logic level?
NO
Check IC3.
YES
YES
YES
OK
Does a signal appear at the collector of Q1?
NO
Check the microphone, the microphone connection, R31, R33, C28 and C30.
YES
Check Q1, D6 and SA1.
Check D21 and D10.
Is there a dial tone at pin 20 and 21 of IC2?
NO
Is the voltage at pin 29 of IC3 at a low logic level?
NO
Check IC3.
YES
YES
Check the handset and the cord.
Is Q9 OFF?
NO
Check Q9.
YES
Check IC2.

3) PULSE DIALING PROBLEMS


Can a pulse sound be monitored?
NO
YES
Does the voltage across Tip (T) and Ring (R) rapidly switch between 48 V and 10 V?
NO
Check D6, SA1, Q1 and Q2.
YES
OK
Do pulses (0.6 Vp-p) appear at pin 36 of IC3?
NO
Check IC3.
YES
Do pulses (0.6 Vp-p) appear at the base of Q2?
NO
Check Q6 and Q7.
YES
Check Q1, D6, SA1 and Q2.

4) TONE DIALING PROBLEMS


Can the DTMF sound be monitored?
NO
Does a DTMF signal appear at pin37 of IC3?
NO
Check IC3.
YES
YES
Are the DTMF signals composed of 2 frequencies?
YES
Is the voltage at pin 31 of IC3 at a high logic level during the DTMF?
NO
Check IC3.
NO
YES
Check IC3.
Can the DTMF signal appear at the collector of Q5?
NO
Check Q5.
YES
Check Q1, Q2, D6 and SA1.
Does the DTMF signal appear at the base of Q5?
YES
NO
OK
YES
Does the DTMF signal appear at T–R (Tip–Ring)?
Check R56 and C36.
NO
Check Q5.

CASSETTE DECK PARTS LOCATION

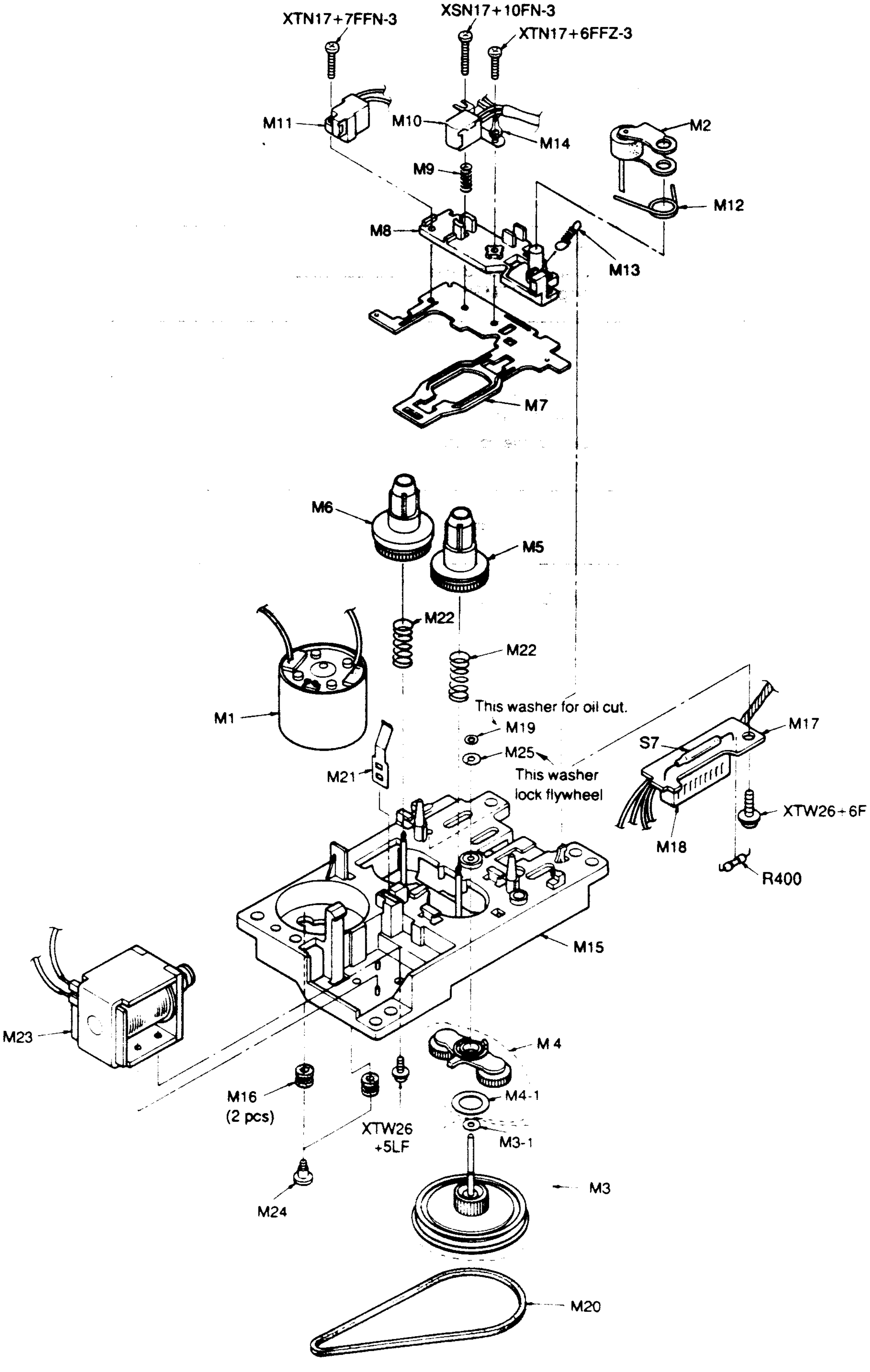

XTN17+7FFN-3
XSN17+10FN-3
XTN17+6FFZ-3
M11
M10
M14
M2
M9
M12
M8
M13
M7
M6
M5
M22
M22
M1
This washer for oil cut.
M19
M25
This washer lock flywheel
M21
M17
S7
XTW26+6F
M18
R400
M15
M23
M4
M4-1
M16
(2 pcs)
XTW26
+5LF
M3-1
M3
M24
M20

Fig. 20

CABINET AND ELECTRICAL PARTS LOCATION

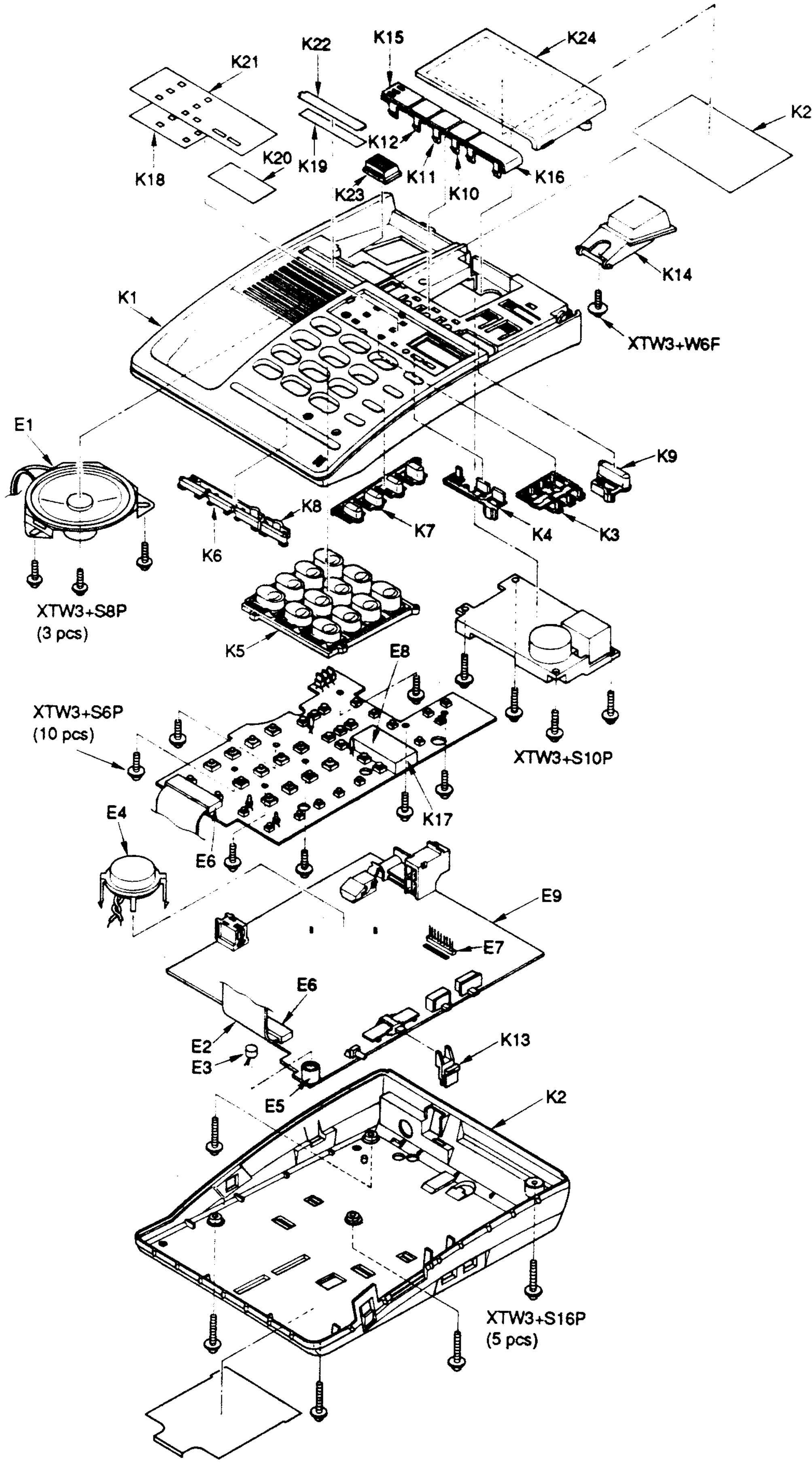

K21
K22
K15
K24
K25
K18
K20
K19
K12
K23
K11
K10
K16
K14
K1
XTW3+W6F
E1
K9
K8
K7
K4
K3
K6
XTW3+S8P
(3 pcs)
K5
E8
XTW3+S6P
(10 pcs)
XTW3+S10P
K17
E4
E6
E9
E7
E6
E2
E3
K13
E5
K2
XTW3+S16P
(5 pcs)

Fig. 21

REPLACEMENT PARTS LIST

Model KX-T2634

Notes:

1. Printed circuit board assembly with mark (NLA) is no longer available after production discontinuation of the complete set.
2. Important safety notice.
   Components identified by the ⚠ mark special characteristics important for safety. when replacing any of these components, use only manufacture's specified parts.
3. The S mark indicates service standard parts and may differ from production parts.
4. RESISTORS & CAPACITORS
   Unless otherwise specified.
   All resistors are in ohms(Ω) k=l000Ω,M=l000kΩ
   All capacitors are in MICRO FARADS(μF) P=μμF

*Type &Wattage of Resistor

Type

ERC:Solid	ERX:Metal Film	PQ4R:Carbon
ERD:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
PQRD:Carbon	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12,50,S1:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,PQCBC : Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG : Polyster
PQCUV, ECUV, PQCBX:Chip	ECEA,ECSZ : Electrolytic
ECQMS:Mica	ECQP : Polyproplylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H: 50V	05: 50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :63V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

Ref. No.	Part No.	Part Name & Description	Pcs
		MECHANICAL PARTS	
M1	PQFM9909Z	Motor Ass'y (with Pulley)	1
M2	PQFD9913Z	Pinch Roller Ass'y	1
M3	PQFF9909Z	Flywheel Ass'y	1
M3-1	PQFN35Z	Washer	1
M4	PQFG9904Z	Gear Ass'y	1
M4-1	PQFN48Z	Washer	1
M5	PQFR9912Z	Takeup Reel Table Ass'y	1
M6	PQFR9913Z	Supply Reel Table Ass'y	1
M7	PQFD82Z	Head Base Plate	1
M8	PQFW42Z	Head Base	1
M9	PQFS73Z	Spring	1
M10	PQJH1M2Z	R/P Head	1
M11	PQJH6M2Z	Erase Head	1
M12	PQFS109Z	Spring	1
M13	PQFS110Z	Spring	1
M14	PQFJ2Z	Terminal	1
M15	PQFC9909X	Mechanism Chassis Ass'y	1
M16	PQFI14Z	Rubber Parts, Motor Spacer	2
M17	PQUP589Z	Reed Switch P.C.Board	1
M18	PQJS9B30Z	Connector, 9Pin	1
M19	PQFN33Z	Washer (for Oil cut)	2
M20	PQFB12Z	Belt	1
M21	PQFD64Z	Plate Spring	1
M22	PQFS82Z	Spring	2
M23	PQFP126Y	Plunger	1
M24	PQHD15Z	Screw	2
M25	PQFN49Z	Washer (for lock of flywheel)	1
		INTEGRATED CIRCUITS, TRANSISTORS AND DIOSES	
IC1	PQVIBA6565A	IC	1 ⚠
IC2	PQVISC79054A	IC	1
IC3	MN158413KPC	IC	1
IC4	PQVIT6668	IC	1
IC5	PQVIVGH6240A	IC	1
IC6	PQVIRMH6240A	IC	1
IC7	PQVI4678A02H	IC	1
IC8	AN6180K	IC	1
IC9	PQVIBA6220	IC	1
IC10,11	PQVITM41256A	IC S	2
IC12	PQVIUPC358C	IC S	1
IC301	PQVI01G114	IC	1
Q1	2SA1625	Transistor (Si)	1 ⚠
Q2	2SD662B	Transistor (Si)	1 ⚠
Q3	2SA937	Transistor (Si) S	1
Q4, 6~10, 12, 14~16, 21, 24, 27 ,301	2SD1819A	Transistor (Si) S	14
Q5	2SC2120	Transistor (Si)	1
Q11,13,17	2SB1218A	Transistor (Si) S	3
Q18, 19 ,23, 26	2SB909M	Transistor (Si)	4
Q20, 22	2SC1652	Transistor (Si)	2
Q25	2SC3330	Transistor (Si) S	1
Q28, 29	2SD1266	Transistor (Si)	2
D1~4	1SS131	Diode (Si) S	4 ⚠
D5	MA4300	Diode (Si) S	1 ⚠
D6	PQVDS1ZB40F1	Diode (Si)	1 ⚠
D10	MA4180	Diode (Si) S	1
D12	MA7051	Diode (Si)	1
D11,13,14 16~18, 20~23, 25~30, 35 , 308~312	MA165	Diode (Si) S	23
D15, 19, 37, 38	1S1588	Diode (Si) S	4
D24	PQVD05AZ3.0	Diode (Si)	1
D31,33,34	1SS119	Diode (Si)	3
D32	PQVDMTZ6R8	Diode (Si)	1
D36	MA4062	Diode (Si) S	1
D301, 305	LN28RPL	LED	2
D302, 304	LN268RPXTAB	LED	2
D303	LN368GPXTAB	LED	1
D306, 307	LN28RPXTA3	LED	2
D313	PQVDHZ2CLL01	Diode (Si)	1
		JACKS	
JJ1	PQJJ1TB18Z	Jack, Telephone	1 ⚠
JJ2	PQJJ2HA2Z	Jack, DC IN	1
		SWITCHES	
S1	ESE14A211	Switch,Hook	1 ⚠
S2	PQSS3A17Z	Switch, Ringer (for silver)	1
S2	PQSS3A17W	Switch, Ringer (for white)	1
S3	PQSS2A27Z	Switch, Tone/Pulse (for Silver)	1
S3	PQSS2A27W	Switch, Tone/Pulse (for white)	1
S4	EVQQEJ08Q	Swith, ON/OFF	1
S301~303, 305~307 , 309 323~330	EVQQS204B	Switch, F/F, REW, MEMO 2WAY, , ICM ERASE, P/P, OGM REC , OGM PLAY, Redial, Hold, etc.	15
S304, 308 , 322, 331~336	EVQ12405K	Switch, Auto Auswer, Announce , Lower, Direct	9
S310~321	PQSH1A33Z	Switch, Dialing	12
S100	PQSE91Z	Switch, Reed (for DECK)	1
		CERAMIC FILTERS	
X1	PQVBFC3584A1	Ceramic Filter	1
X2	PQVBT4.0G2	Ceramic Filter	1
X3	PQVFCSB400P	Ceramic Filter	1
X4	PQVBKBR655B	Ceramic Filter	1
X301	PQVCL3276N6	Ceramic Filter	1
		OTHERS	
SA1	PQVDSAE310F1	Varistor (Surge Absorber)	1 ⚠

Ref. No	Part No.	Part Name & Description	Pcs
VR2	PQNB3A00B14M	Semi-Fixed, Resistor 10kΩ	1
VR3	PQVAM3A14B24	Semi-Fixed, Resistor 20kΩ	1
PC1	PQVIPC817K	Photo Electric Transducer (Photo Coupler) S	1
R330	PQNB3A00B52M	Semi-Fixed, Resistor 500Ω	1
		CABINET PARTS	
K1	PQKM159Z9	Upper Cabinet (for silver)	1
K1	PQKM159Y8	Upper Cabinet (for white)	1
K2	PQYF1031X0	Lower Cabinet Assembly (for silver)	1
K2	PQYF1031X7	Lower Cabinet Assembly (for white)	1
K3	PQBCX100Z	Button, Direct Call	1
K4	PQBCX101Z	Button, Announce, Auto Answer ,Lower	1
K5	PQBCX87Z2	Button, Dialing (for silver)	1
K5	PQBCX87Z	Button, Dialing (for white)	1
K6	PQBCX88Z2	Button, Tone, Flash, Mute, Hold (for silver)	1
K6	PQBCX88Z	Button, Tone, Flash, Mute, Hold (for white)	1
K7	PQBCX89Z2	Button, Auto, Program, Pause/Save, Redial (for silver)	1
K7	PQBCX89Z	Button, Auto, Program, Pause/Save, Redial (for white)	1
K8	PQBC204Z3	Button, Speakerphone (for silver)	1
K8	PQBC204Z	Button, Speakerphone (for white)	1
K9	PQBC205Z	Button, Playback/Pause	1
K10	PQBC206X3	Button, F/F (for silver)	1
K10	PQBC206X	Button, F/F (for white)	1
K11	PQBC206Y3	Button, Rewind (for silver)	1
K11	PQBC206Y	Button, Rewind (for white)	1
K12	PQBC206Z3	Button, Memo (for silver)	1
K12	PQBC206Z	Button, Memo (for white)	1
K13	PQBD113Z1	Knob, Volume (for silver)	1
K13	PQBD113Z	Knob, Volume (for white)	1
K14	PQBE22Z2	Button, Hook (for silver)	1
K14	PQBE22Z	Button, Hook (for white)	1
K15	PQGG67Z1	Grille (for silver)	1
K15	PQGG67Z	Grille (for white)	1
K16	PQGG68Y1	Grille (for silver)	1
K16	PQGG68Y	Grille (for white)	1
K17	PQHR9277Z	LCD Spacer	1
K18	PQHP5024Z	Telephone Card (Large)	1
K19	PQHP532X	Telephone Card (Small)	1
K20	PQHR5186Z	LCD Panel	1
K21	PQHR5187Z	Transparent Plate (Large) (for silver)	1
K21	PQHR5187Y	Transparent Plate (Large) (for white)	1
K22	PQHR576Z	Transparent Plate (Small)	1
K23	PQKE46Y4	Hanger (for silver)	1
K23	PQKE46Y2	Hanger (for white)	1
K24	PQKG5X	Cassette Lid (for silver)	1
K24	PQKG5Y	Cassette Lid (for white)	1
K25	PQQT5100Z	Instruction Label	1
		ELECTRICAL PARTS	
E1	PQAS65P19Z	Speaker	1
E2	PQJE76Z	Lead Wire	1
E3	PQJM120Z	Microphone	1
E4	PQWHT2390M	Buzzer Assembly	1
E5	PQHG539Z	Rubbr Parts, Microphone	1
E6	PQJS24X53Z	Connector (24 pin) [CN2]	2
E7	PQJP9D71Z	Connector [CN1] (9 pin)	1
E8	PQADLT3C204A	Liquid Crystal Display	1
E9	PQWPT2634M	Printed Circuit Board (NLA)	1

Ref. No	Part No.	Part Name & Description	Pcs
		HANDSET PARTS	
H1	PQJX2PV407Z	Handset Assembly (for silver)	1
H1	PQJX2PS407Z	Handset Assembly (for white)	1
H1-1	PQKM121D73	Upper Cabinet (for silver)	1
H1-1	PQKM127H85	Upper Cabinet (for white)	1
H1-2	PQKF104Z73	Lower Cabinet (for silver)	1
H1-2	PQKF110Z85	Lower Cabinet (for white)	1
H1-3	PQAX4P03Y	Speaker	1
H1-4	PQWMJX403Z	Microphone	1
H1-5	PQHM67Z	Weight	1
H1-6	PQHG695V	Rubber Cap (for silver)	2
H1-6	PQHG695W	Rubber Cap (for white)	2
		ACCESSORIES	
A1	KX-A11	AC Adaptor (for silver)	1
A1	KX-A11-W	AC Adaptor (for white)	1
A2	PQJA30L	Handset Cord (for silver)	1
A2	PQJA30M	Handset Cord (for white)	1
A3	PQJA59Y	Telephone Cord S	1
A4	RT-N30-JT1P	Magnetic Recording Tape	1
A5	PQQX5976Z	Instruction Book	1
A6	PQQX9423Z	Dial Card	1
A7	PQHP5020W	Memo Card	1
A8	PQKL26Z0	Stand (for silver)	1
A8	PQKL26Z7	Stand (for white)	1
		PACKING MATERIALS	
P1	PQPK724Z	Gift Box (for silver)	1
P1	PQPK864Z	Gift Box (for white)	1
P2	PQPN881Z	Cushion	1
P3	PQPN795Z	Accessory Box	1
P4	XZB26X40A01	Protection Cover (for Set)	1
P5	PQPH75Z	Protection Cover (for Handset)	1

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
		RESISTORS			
R1	ERDS1TJ622	6.2K ⚠	R35	Not Used	
R2	PQ4R10XJ123	12K ⚠	R36	PQ4R10XJ104	100K
R3	PQ4R10XJ334	330K ⚠	R37	PQ4R18XJ472	4.7K
R4	PQ4R10XJ124	120K	R38	PQ4R10XJ183	18K
R5	PQ4R10XJ223	22K	R39	PQ4R10XJ333	33K
R6	PQ4R10XJ331	330	R40	PQ4R18XJ333	33K
R7	PQ4R10XJ392	3.9K	R41	PQ4R10XJ392	3.9K
R8	Not Used		R42	PQ4R10XJ562	5.6K
R9	PQ4R18XJ683	68K ⚠	R43	PQ4R10XJ182	1.8K
R10	PQ4R18XJ104	100K ⚠	R44	PQ4R10XJ102	1K
R11	PQ4R10XJ472	4.7K ⚠	R45	PQ4R10XJ102	1K
R12	ERDS1TJ820	82	R46	PQ4R18XJ104	100K
R13	PQ4R18XJ102	1K	R47	PQ4R10XJ563	56K
R14	PQ4R10XJ473	47K	R48	PQ4R10XJ184	180K
R15	PQ4R10XJ563	56K	R49	PQ4R10XJ104	100K
R16	PQ4R10XJ473	47K	R50	PQ4R18XJ184	180K
R17	PQ4R18XJ912	9.1K	R51	PQ4R10XJ274	270K
R18	PQ4R10XJ682	6.8K	R52	PQ4R18XJ153	15K
R19	PQ4R10XJ821	820	R53	PQ4R10XJ473	47K
R20	PQ4R10XJ390	39	R54	PQ4R10XJ473	47K
R21	ERD25TJ150	15	R55	PQ4R10XJ473	47K
R22	PQ4R10XJ102	1K	R56	PQ4R10XJ103	10K
R23	PQ4R10XJ562	5.6K	R57	PQ4R10XJ333	33K
R24	ERC14GM226	22M	R58	PQ4R18XJ104	100K
R25	PQ4R10XJ104	100K	R59	Not Used	
R26	ERD25TJ473	47K	R60	Not Used	
R27	PQ4R10XJ473	47K	R61	PQ4R18XJ473	47K
R28	PQ4R10XJ393	39K	R62	Not Used	
R29	ERD16TJ4R7	4.7	R63	PQ4R18XJ104	100K
R30	PQ4R18XJ182	1.8K	R64	PQ4R18XJ104	100K
R31	PQ4R18XJ822	8.2K	R65	PQ4R10XJ103	10K
R32	PQ4R18XJ393	39K	R66	PQ4R10XJ104	100K
R33	PQ4R10XJ153	15K	R67	PQ4R10XJ103	10kK
R34	PQ4R10XJ103	10K	R68	PQ4R10XJ473	47K

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
R69	PQ4R10XJ473	47K	R136	PQ4R10XJ103	10K
R70	PQ4R10XJ183	18K	R137	PQ4R10XJ681	680
R71	PQ4R18XJ103	10K	R138	PQ4R10XJ471	470
R72	PQ4R10XJ562	5.6K	R139	PQ4R10XJ473	47K
R73	PQ4R10XJ394	390K	R140	PQ4R10XJ473	47K
R74	PQ4R10XJ103	10K	R141	PQ4R10XJ471	470
R75	PQ4R10XJ103	10K	R142	PQ4R10XJ221	220
R76	PQ4R10XJ472	4.7K	R143	PQ4R18XJ151	150
R77	PQ4R10XJ103	10K	R144	PQ4R10XJ681	680
R78	PQ4R10XJ224	220K	R145	PQ4R10XJ103	10K
R79	PQ4R10XJ154	150K	R146	ERD25TJ120	12
R80	PQ4R10XJ154	150K	R147	PQ4R18XJ102	1K
R81	PQ4R18XJ104	100K	R148	PQ4R10XJ473	47K
R82	PQ4R18XJ104	100K	R149	PQRQ2VJ100	10
R83	PQ4R18XJ473	47K	R150	ERDS1TJ391	390
R84	PQ4R10XJ2R2	2.2	R151	PQ4R18XJ104	100K
R85	PQ4R18XJ103	10K	R152	PQ4R10XJ153	15K
R86	PQ4R18XJ272	2.7K	R153	PQ4R18XJ473	47K
R87	PQ4R10XJ105	1M	R154	PQ4R10XJ473	47K
R88	PQ4R10XJ472	4.7K	R155	PQ4R10XJ104	100K
R89	PQ4R18XJ222	2.2K	R156	PQ4R10XJ472	4.7K
R90	PQ4R10XJ472	4.7K	R157	PQ4R18XJ562	5.6K
R91	PQ4R10XJ103	10K	R158	Not Used	
R92	PQ4R10XJ121	120	R159	Not Used	
R93	PQ4R10XJ122	1.2K	R160	PQ4R10XJ224	220K
R94	PQ4R10XJ563	56K	R161	Not Used	
R95	PQ4R10XJ183	18K	R162	PQ4R10XJ104	100K
R96	PQ4R10XJ224	220K	R163	PQ4R10XJ682	6.8K
R97	PQ4R10XJ101	100	R164	Not Used	
R98	PQ4R18XJ224	220K	R165	Not Used	
R99	PQ4R10XJ473	47K	R166	PQ4R10XJ104	100K
R100	PQ4R10XJ333	33K	R167	PQ4R18XJ104	100K
R101	PQ4R10XJ334	330K	R168	PQ4R10XJ222	2.2K
R102	PQ4R10XJ183	18K	R169	PQ4R10XJ272	2.7K
R103	PQ4R10XJ680	68	R170	PQ4R10XJ103	10K
R104	PQ4R10XJ103	10K	R171	PQ4R10XJ473	47K
R105	PQ4R10XJ103	10K			
R106	PQ4R10XJ333	33K	R301	ERD16TJ152	1.5K
R107	PQ4R10XJ224	220K	R302	ERD16TJ152	1.5K
R108	PQ4R10XJ224	220K	R303	ERD16TJ152	1.5K
R109	PQ4R10XJ564	560K	R304	ERD16TJ221	220
R110	PQ4R10XJ105	1M	R305	ERD25TJ152	1.5K
R111	PQ4R10XJ473	47K	R306	ERD16TJ152	1.5K
R112	PQ4R18XJ273	27K	R307	ERD16TJ152	1.5K
R113	PQ4R10XJ473	47K	R308	PQ4R10XJ104	100K
R114	PQ4R10XJ684	680K	R309	ERD16TJ104	100K
R115	PQ4R10XJ473	47K	R310	ERD16TJ104	100K
R116	PQ4R18XJ473	47K	R311	ERD16TJ104	100K
R117	PQ4R18XJ220	22	R312	ERD16TJ104	100K
R118	PQ4R10XJ223	22K	R313	ERD16TJ104	100K
R119	PQ4R10XJ223	22K	R314	ERD16TJ104	100K
R120	PQ4R10XJ105	1M	R315	PQ4R10XJ104	100K
R121	PQ4R18XJ472	4.7K	R316	ERD16TJ104	100K
R122	PQ4R18XJ104	100K	R317	ERD16TJ103	10K
R123	PQ4R18XJ821	820	R318	PQ4R10XJ473	47K
R124	PQ4R18XJ473	47K	R319	PQ4R10XJ473	47K
R125	PQ4R10XJ684	680K	R320	PQ4R10XJ224	220K
R126	PQ4R18XJ104	100K	R321	PQ4R10XJ104	100K
R127	PQ4R18XJ472	4.7K	R322	PQ4R10XJ104	100K
R128	PQ4R18XJ103	10K	R323	PQ4R10XJ104	100K
R129	PQ4R18XJ223	22K	R324	ERD16TJ103	10K
R130	PQ4R10XJ683	68K	R325	PQ4R10XJ154	150K
R131	ERD25TJ220	22	R326	ERD16TJ105	1M
R132	PQ4R10XJ681	680	R327	ERD16TJ394	390K
R133	PQ4R10XJ221	220	R328	ERD16TJ105	1M
R134	PQ4R10XJ473	47K	R329	PQ4R10XJ104	100K
R135	ERD25TJ220	22			
			R400	ERD16TJ563 (for DECK)	56K

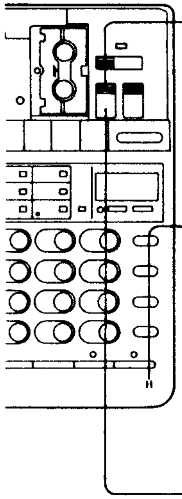
Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
CAPACITORS					
C1	ECQE2105KF	1 ⚠	C69	PQCUV1H333JC	0.033
C2	ECEA1HKS100	10 ⚠	C70	ECEA0JK221	220
C3	ECEA1HKSR22	0.22 ⚠	C71	PQCUV1H103KB	0.01
C4	ECQM1H822JV	0.0082	C72	ECEA1CK101	100
C5	PQCUV1H223KB	0.022	C73	ECEA1HKSR22	0.22
C6	ECKD2H681KB	680P ⚠	C74	ECEA1HKS4R7	4.7
C7	ECKD2H681KB	680P ⚠	C75	ECEA1HKS4R7	4.7
C8	ECEA1CU221	220	C76	ECEA1HKS010	1
C9	ECEA1HKS010	1	C77	PQCUV1H681JC	680P
C10	PQCUV1H103KB	0.01	C78	ECEA1CKS100	10
C11	ECEA1EK470	47	C79	ECEA1CKS100	10
C12	ECEA1AU101	100	C80	PQCUV1H103KB	0.01
C13	PQCUV1H222KB	0.0022	C81	ECEA0JKS220	22
C14	ECEA1HKS100	10	C82	ECEA1HKS3R3	3.3
C15	ECFD1C104KD	0.1	C83	ECUV1H103KB	0.01
C16	PQCUV1H103KB	0.01	C84	PQCUV1E473MD	0.047
C17	ECEA1HKS010	1	C85	PQCUV1H103KB	0.01
C18	PQCUV1H222KB	0.0022	C86	ECUV1H223MD	0.022
C19	ECFD1C104KD	0.1	C87	ECEA0JK221	220
C20	ECEA1HKS010	1	C88	ECEA1CKS470	47
C21	ECEA1HKS010	1	C89	PQCUV1H221JC	220P
C22	ECEA1HKS4R7	4.7	C90	PQCUV1H221JC	220P
C23	PQCUV1H821JC	820P	C91	ECFD1C104KD	0.1
C24	ECUV1H224ZF	0.22	C92	ECFD1C104KD	0.1
C25	ECEA1CKS470	47	C93	PQCUV1H101JC	100P
C26	ECEA1CK101	100	C94	PQCUV1E104ZF	0.1
C27	ECEA1HKS4R7	4.7	C95	PQCUV1H101JC	100P
C28	PQCUV1H103KB	0.01	C96	PQCUV1H101JC	100P
C29	PQCUV1H123MD	0.012	C97	PQCUV1E104ZF	0.1
C30	ECUV1H104MD	0.1	C98	PQCUV1E104ZF	0.1
C31	ECEA1HKS100	10	C99	PQCUV1H223KB	0.022
C32	PQCUV1H102J	0.001	C100	ECEA1AU221	220
C33	PQCUV1E333MD	0.033	C101	ECEA0JU682	6800
C34	PQCUV1E104ZF	0.1	C102	ECEA1HKS3R3	3.3
C35	ECEA1HKS010	1	C103	Not Used	
C36	ECFD1C104KD	0.1	C104	PQCUV1H103KB	0.01
C37	ECUV1H333JC	0.033	C105	PQCUV1H103KB	0.01
C38	PQCUV1E104ZF	0.1	C106	PQCUV1H103KB	0.01
C39	ECUV1H221JC	220P	C107	PQCUV1H103KB	0.01
C40	PQCUV1H472KB	0.0047	C108	PQCUV1H103KB	0.01
C41	ECUV1H331JC	330P	C109	Not Used	
C42	ECEA0JU102	1000	C110	ECUV1H103KB	0.01
C43	PQCUV1E473MD	0.047	C111		
C44	ECUV1H223MD	0.022	|	Not Used	
C45	ECUV1H222MD	0.0022	C113		
C46	PQCUV1H223KB	0.022	C114	PQCUV1H333JC	0.033
C47	ECFD1E473KD	0.047	C115	Not Used	
C48	ECFD1E473KD	0.047	C116	PQCUV1H223KB	0.022
C49	PQCUV1H222KB	0.0022	C117	Not Used	
C50	ECEA1HKS0R1	0.1	C118	ECEA1CKS470	47
C51	ECEA1CK101	100	C119	Not Used	
C52	ECUV1H104MD	0.1	C120	PQCUV1H102J	0.001
C53	ECUV1H472KB	0.0047	C121		
C54	PQCUV1H102J	0.001	|	Not Used	
C55	Not Used		C124		
C56	ECEA0JK221	220	C125	PQCUV1H103KB	0.01
C57	Not Used		C126	PQCUV1H223KB	0.022
C58	ECUV1H103KB	0.01			
C59	ECEA0JK221	220			
C60	ECEA0JU331	330	C301	EECW0HS473Z	0.047
C61	PQCUV1H103KB	0.01	C302	PQCUV1E104ZF	0.1
C62	PQCUV1H681JC	680P	C303	PQCUV1H220JC	22P
C63	ECEA1HKS010	1	C304	PQCUV1H240JC	24P
C64	ECFD1C104KD	0.1	C305	PQCUV1H330JC	33P
C65	ECFD1C104KD	0.1	C306	Not Used	
C66	ECUV1H103KB	0.01	C307	ECUV1H104MD	0.1
C67	ECEA1HKSR47	0.47			
C68	PQCBC1C103MY	0.01			

OPERATIONS

RECORDING THE OGM

The OGM will inform the calling party of your absence and will ask to leave a message.

■ **If you pause for over 2 seconds while recording**, you will hear series of warning tones (6 beeps) and the announcement "Please record your Outgoing Message again". If this happens, start with step 1 again.



1

Push **OGM REC** until a long beep is heard, then release it.

2 After the long beep, speak clearly and loudly into the microphone (MIC), from **approximately 8 inches away**.
- OGM recording time is 16 seconds.
- The LC Display will show;

0 → 1 → 2 →.... → 15

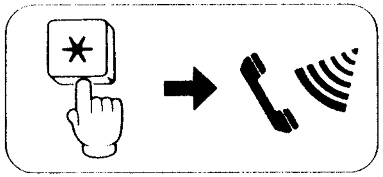
3

When recording is finished, push **OGM REC** again.
- The OGM has been recorded on the Microchip.
- The OGM will be played back automatically.
- After reviewing the OGM, the unit will rewind the tape to the beginning **to record the OGM onto the tape**.

NOTE:
If a power failure takes place or the AC adaptor is disconnected, the OGM recorded on the Microchip will be erased. After the power is restored, the unit will automatically re-record the OGM onto the Microchip using the OGM recorded on the tape.

SKIPPING OGM FOR ICM RECORDING

If you or the caller does not want to hear the Outgoing Message, the unit **can be switched promptly to the Incoming Message mode**. **Call your unit, then;**



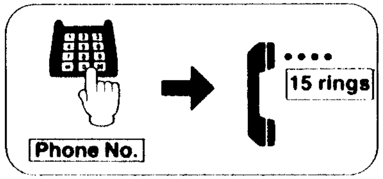
1 Push " * " during the OGM.

2 After you hear the long beep, **speak** clearly and loudly to record your Incoming Message

SETTING/CANCELLING THE ANSWER MODE

You can easily set or cancel the Answer mode from a remote phone.

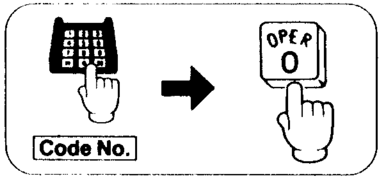
To Set



1 Call your unit.

2 Wait for **15 rings**, the unit will answer. (You may hang up at this time.)
- OGM will be heard.
- The unit will be ready for recording incoming calls.

To Cancel



1 Call your unit.

2 Push **the Code No.** during the OGM.

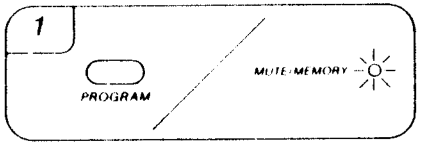
3 Push **"0" right after you hear the synthesized voice telling the number of the recorded messages**.
- **"Turn off"** will be heard.
- The unit will not answer any calls.

STORING PHONE NUMBERS FOR ONE-TOUCH DIALING

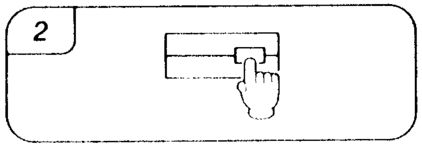
There are 6 Direct Call buttons, each Direct Call button consists Upper and Lower memory locations. Each location (upper and lower) is capable of storing 16 digits.

Be sure that the handset is on the cradle, the SPEAKERPHONE indicator is off and the AC adaptor is connected.

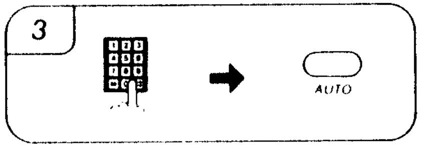
Using the Upper memory location



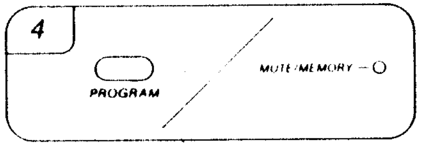
Push **PROGRAM** until the MEMORY indicator lights.



Push **the Direct Call button**.
- The MEMORY indicator will go out.



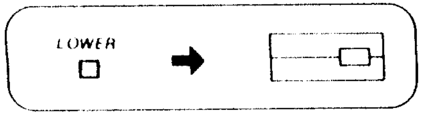
Enter **the phone number**, then push **AUTO**.
- Up to 16 digits.
- The MEMORY indicator will light.
- To store the phone number in succession, repeat from step 2 to 3.



After storing all the numbers, push **PROGRAM**.
- The MEMORY indicator will go out.

Using the Lower memory location

Another phone number can be stored into the Lower memory section of the same station. In this case, you must change step 2 of the storing procedure as follows:

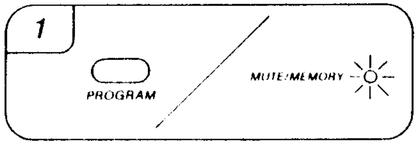


Push **LOWER**, then push **the Direct Call** button.

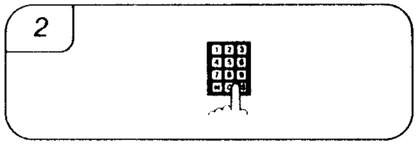
STORING PHONE NUMBERS FOR ONE-TOUCH DIALING

Each dialing button (1 through #) serves as a memory station. Each memory station is capable of storing 16 digits.

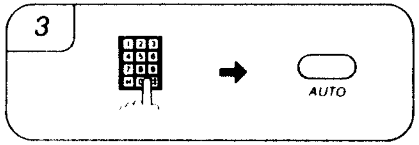
Be sure that the handset is on the cradle, the SPEAKERPHONE indicator is off and the AC adaptor is connected.



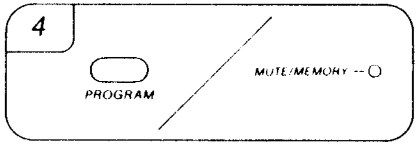
Push **PROGRAM** until the MEMORY indicator lights.



Push **the station number (1 through #)**.
- The MEMORY indicator will go out.



Enter **the phone number**, then push **AUTO**.
- Up to 16 digits are stored.
- The MEMORY indicator will light.
- To store the phone number in succession, repeat from step 2 to 3.



After storing all the numbers, push **PROGRAM**.
- The MEMORY indicator will go out.

STORING PHONE NUMBERS BEHIND PBX

Push the buttons as follows:

PROGRAM — Station No. (1 through #). — 9 — PAUSE — Phone No. —

AUTO — PROGRAM

- As for the PAUSE button, refer to the Operating Instructions.
- You may use the Direct Call button instead of the station number.

STORING A TRANSFER NO. FROM A REMOTE PHONE

If you forget to program the transfer number to which the ICM is transferred, the number can be programmed from a remote phone.

1 Call your unit and push **the Code Number** during OGM.

2 Push as follows, immediately after you hear the synthesized voice telling you the number of recorded messages.

- **For the unit at home;**

[✳] [3] — Listen to a beep — [Phone No.] — [✳] [9]
Initial Setting — Final Setting

- **For the Unit behind PBX system;**

[✳] [3] — Listen to a beep — [9] — [✳] [0] — [Phone No.] — [✳] [9]
Initial Setting
1 Pause
(2 pauses [✳][0]-[✳][0])
Line Access No.
Final Setting

To Confirm

Repeat storing procedure.
Refer to "CONFIRMING A STORED NUMBER" on page 21.

To Set the Transfer Mode Immediately after Storing Phone Number

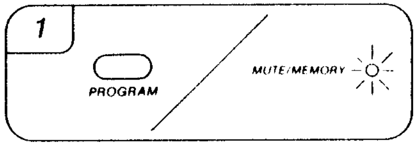
Within 10 seconds after storage, push "✳" and "1" in sequence.

NOTE:
- In some areas, a remote tone phone may not function due to telephone line conditions such as line noise, echo, etc.
- The unit may not respond if a touch tone telephone produces tones that are too short to activate the unit.

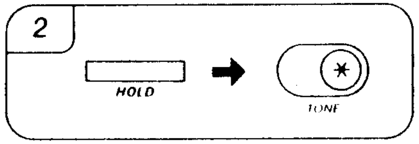
REMOTE CODE SETTING

You must set and remember your own Remote Code Number.
Choose your Code Number from the digits 0 to 999.

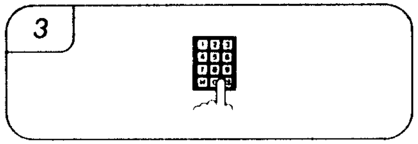
Be sure that the handset is on the cradle, the SPEAKERPHONE indicator is off and the AC adaptor is connected.



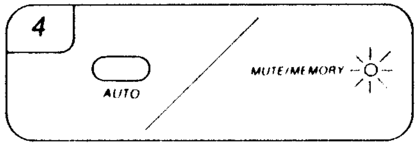
Push **PROGRAM** until the MEMORY indicator lights.



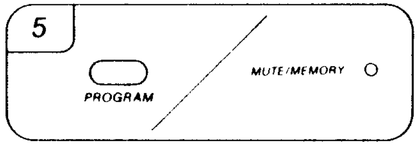
Push **HOLD**, then push "✳" for remote code setting.
- The MEMORY indicator will go out.
- The LC Display will show the previously stored remote code no.



Push the code number that you want to use.
- The LC Display will show the entered number.



Push **AUTO**.
- The MEMORY indicator will light.



Push **PROGRAM**.
- The MEMORY indicator will go out.

- We recommend that you do not use the numbers seven (7) and zero (0) as a remote code number, since these are the command numbers for "Cancelling the Answer mode" and "Re-recording the OGM".
- If you notice an error during programming, push the PROGRAM button and then repeat programming procedure.

Announcements by the Unit

Announcement Type	When the announcement is said
Monday seven o'clock AM	Display shows AM 7:00 •When you push the ANNOUNCE button.
Number of messages received twelve (12 messages are recorded)	•When you push the playback button. •When you push your Code No. on a remote phone.
End of the final message	When all the recorded messages have been played back.
End of tape	When the cassette tape is full.
Please record your Outgoing Message again	When you paused for over 2 seconds while recording your OGM.
Thank you for calling	•When you finished recording a marker message from a remote operation. •When the Recording Time mode is set to Announce Only (at the end of the OGM).

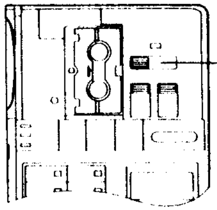
■ While operating your unit from a remote phone, you can hear the voice synthesized instructions. Refer to the Operating Instructions.

Liquid Crystal Display

Display Type	When the display shows
AM 10:30 (Real Time)	When you set the ANSWER SYSTEM ON/OFF switch to "OFF".
OGM 5 (Tape Timer)	While you are recording the Outgoing message. **example:** "5" means 5 seconds have elapsed.
MESSAGE 12 (Message Counter)	Recording Time mode is set to "**1 MIN** or **VOX**". The display will show the number of recorded messages.
CALL 8 (Call Counter)	Recording Time Mode: "**Announce Only**". The display shows the number of calls received.
E r r (Error)	•When the cassette tape is broken or not inserted. •If there is more than a 2-second pause in the recording of the OGM.
MESSAGE - -	•After plugging the AC Adaptor into the unit at the initial use. •When power is restored after a power interruption.

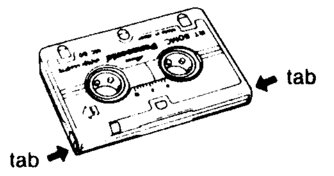
ERASING THE RECORDED MESSAGES

After you have played back the recorded messages, you can erase them by simply pushing the ICM ERASE button.



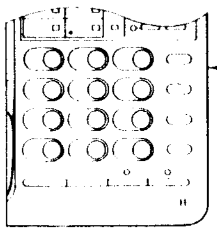
Push **ICM ERASE** until a beep is heard.
- The unit will erase the recorded messages while the tape is rewinding.
- The LC Display will show "0".

The cassette can be erased even if the record-prevention tabs have been removed.



MONITORING THE INCOMING CALLS

While an Incoming Message is being recorded, you can monitor it. Then you may choose to lift the telephone handset and speak to the caller directly.



Adjust the VOLUME control.

■ If you want to talk to the caller, lift the telephone handset or push the SPEAKERPHONE button, and talk.
- The unit will automatically stop recording and will be ready to record the next incoming messages.
- You can talk to the caller by lifting the handset of the another telephone connected to the same line.